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The Physical Therapy Review

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Volume 29 **December 1949** **Number 12**

The Importance of Bracing in the Treatment of Cerebral Palsy

Herbert E. Hipps, M.D., F.A.C.S., and Genevieve Waters

The judicious use of braces is an extremely valuable adjunct in the training program of the cerebral palsied. Much surgery can be eliminated and the development of desired purposive muscle actions can be accelerated by their use.

General Indications

The multiple, wayward muscle actions of the athetoid that hinder purposive action can be restrained in an extremity by a brace, thus permitting the patient to concentrate his attention on one joint movement at a time, and thus, by simplifying the purposive action pattern, make it more easy to learn.

Many weakened muscles, weak and ineffective from overstretching by a more powerful spastic antagonist, often can regain sufficient strength to become effective, if supported by a brace during the early part of the training period.

The development of purposive muscle action can be accelerated by supporting a joint of an extremity in the desired position of optimum function, or by supporting the joint in any position that makes it easier for the patient to use the involved muscles.

Many deformities, such as an equinus foot or a palmar flexed wrist, frequently can be corrected permanently by the wearing of a spring action brace.

Beginning deformities, due to improper muscle action, can be prevented.

Illustrative Cases

K. M.—Spastic hemiplegia, age 12. His left arm was held in rigid extension at the elbow and was carried uselessly behind him when he stood or walked. His wrist was rigidly dorsiflexed, and the fingers remained tightly flexed into the palm of his hand. He could not voluntarily extend the fingers, nor flex the elbow, and he could not bring the arm forward to the front of his body.

This patient never had made any attempt to use his hand and fingers, principally because he could not get the hand to the front of the body in a position where it could be used.

He had been treated by the usual physical therapy methods many times before and had never shown any improvement.

A brace was applied holding the elbow in 90 degrees flexion and the wrist in a neutral position (Fig. 1).

He was given one exercise and only one to perform. This was to flex his shoulder, bringing the arm forward to the front of his body. He

1604 Columbus, Waco, Texas, and Crippled Children's Hospital, 1501 North Eighteenth, Waco, Texas.

Figure 1.

did this many times a day. He practiced continually under our rather strict and constant supervision, and he learned how to do this one thing fairly well in approximately thirty days.

Now the brace was removed part of the time each day and he was given exercises in flexing and extending the elbow. He wore it all the rest of the time, day and night.

At the end of three months the brace was cut off to just below the elbow joint. The upper part of the brace was no longer needed. He held the arm down by the side of his body, he could bring it forward, and he could flex and extend the elbow slowly but with good control.

The brace, now supporting the wrist only, was still worn night and day. He was started on finger exercises. His other arm was tied down against his body so that he had to use his left arm and fingers for everything.

He worked with his left hand constantly. We saw to it that he did.

Within three more months this remaining part of the brace was removed. He could use his hand and fingers creditably and he had formed the habit of using his hand in most of his activities.

He has been seen at intervals since then and is showing a constant improvement.

M. P.—Spastic monoplegia, age 6. He walked with his left knee bent and on the toes of his left foot. The heel cord was tight. It could not be stretched enough to permit the foot to come to a right angle.

A drop ankle brace, with springs in it to stretch the heel cord, was applied. He wore this night and day for four months. Then it was left off during the daytime and he wore it at night. All during this time he was given exercises in extension of the foot.

In three more months he no longer needed the brace. He walked well. He got his heel down on the floor with every step.

He is being rechecked at intervals. His brace has not been used at any time during the last six months, but if any heel cord tightness should recur, then again he would be advised to wear the brace each night until it was again corrected.

D. T.—Athetoid, age 14. She had fair use of both arms and hands, but she could not stand or walk. Uncontrolled, wayward movements of the legs occurred when she attempted to take a step.

Long thigh-length braces were applied to both legs. This permitted her to concentrate attention on hip motions only, as the knees and feet were held relatively immobile in the braces. She learned to stand alone and to walk between rails fairly well within six months time and is now walking for short distances with crutches.

Within another eight or ten months one brace probably will be cut off just below the knee; still later the other one will be done likewise, and perhaps still much later the feet may be liberated.

H. Z.—Spastic hemiplegia, age 16. He had never used his right hand, which was small and palmar-flexed acutely at the wrist. He could flex and extend the fingers slightly. The fingers remained, most of the time, in extension. The wrist could be extended passively but he could not hold it this way.

Obviously this patient could never learn to use his hand and fingers properly as long as the wrist remained in this deformed position. His overstretched extensors were too weak to make much progress against the stronger flexors. Hence, a plastic brace was applied holding the wrist in dorsiflexion but permitting free finger motion. He wore this night and day for four months (Fig. 2).

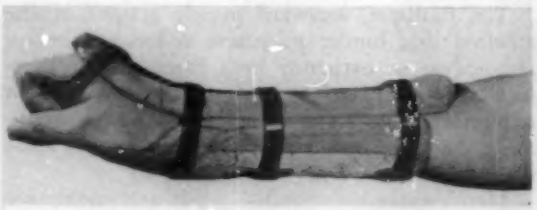

Figure 2.

He was given things to do with his hand. He was kept busy all day long. He was not allowed to rest.

At the end of four months he could flex the fingers completely and he could extend them almost to completion. He had good control over them. Then the brace was removed for short intervals each day while finger and hand work continued. Later it was removed all day, but he continued to wear it at night.

He is still wearing it every night and is using

his hand without the brace all day. He has good use of this formerly useless hand.

P. F.—Mild athetoid, age 8. She walked awkwardly, popping the right knee backward with each step. The knee had thus developed a mild degree of genu recurvatum that was constantly getting worse.

Because of an apparent tightness in the heel cord, a short leg drop ankle brace was applied. Springs in the brace stretched her heel cord.

This did not help her in controlling the back-knee tendency.

Then two curved bars were added to the brace, holding the knee in about 20 degrees flexion (Fig. 3). She wore this for six months. After

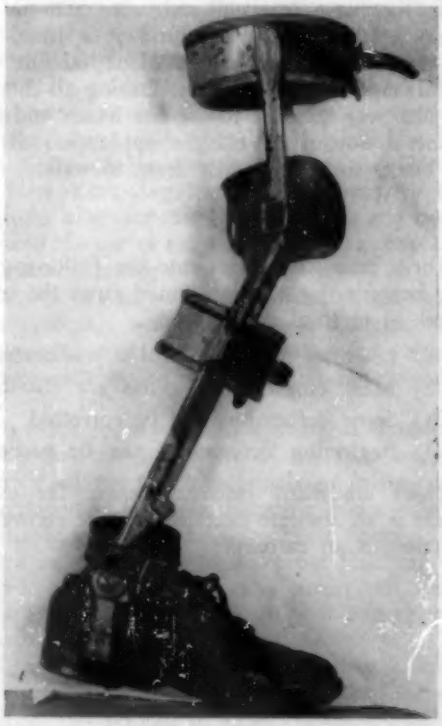

Figure 3.

this, little by little, the brace was left off, and she was given exercises in trying to stand and walk without popping the knee backward. She gradually learned this and is now walking without a brace, but we have applied a one-inch elevation on the right heel. Only when she becomes excited or tries to run does she ever let it return into the genu recurvatum deformity.

J. V.—Spastic monoplegia, age 7. He had one wrist that was acutely and rigidly palmar-flexed. He could not extend it and it was impossible to

Figure 4.

extend it passively. Because of this awkward position, he could not use his fingers.

A brace was applied with a rubber band traction device on it that pulled upward constantly on the hand, gradually pulling the wrist into extension (Fig. 4). He wore this splint night and day for six months, during which time the splint was adjusted at the necessary intervals, to keep a constant, mild upward pull on the hand.

By this time the wrist had been brought into full dorsiflexion but he was not able to hold it there. Accordingly, a smaller, rigid, cock-up splint was applied to hold the correction that had been obtained and he was started on active finger exercises.

K. J.—Spastic hemiplegia, had good use of her involved left leg and of all the joints of the left upper extremity. However, when she flexed the fingers to grasp objects, the thumb pulled in under the flexing fingers and got in the way. She could not abduct the thumb. She could not keep it out of the way of the flexing fingers.

Long and persistent training at home and by competent physical therapists had failed to correct this.

A short wrist splint with an extension to hold the thumb in full abduction was applied (Fig. 5). She wore this night and day for five months. During this time she continully used her hand.

Then the splint was removed for short intervals

Figure 5.

each day and she was taught thumb abduction and opposition. The intervals were increased as she gained in ability to control the thumb.

Figure 6.

Now she wears the splint only at night. She can abduct and oppose the thumb slowly but fairly well and it no longer pulls down in the way of the flexing fingers.

M. F.—Spastic, age 3. She could not stand, walk, sit alone, or hold up her head. She had no voluntary control of her hands and arms. She had been considered as a "hopeless case."

A chair-brace was built for her (Fig. 6). She was held in this chair by straps across the legs, lap, pelvis and chest. A movable head piece supported the head, while permitting rotary movements of the head.

She was kept in this chair-brace practically all day long every day. As she moved her head from side to side, to see things of interest, she gained control of the neck muscles. Gradually the head support was left off as she learned to balance the head. Then little by little the back piece of the chair-brace and the chest strap was lowered. She then became able to sit alone without any back support, but with the side arm supports. Now these too were lowered and were moved away from her body slowly a little at a time, until she finally was able to sit alone on the chair seat unsupported in any way. During all this time she also was learning to use her hands and arms.

She is now ready for the application of long leg braces so that she may learn to walk.

* * * * * * *

These cases clearly indicate the following specific benefits that can be gained from the use of braces in cerebral palsy:

(1) Learning muscle control is accelerated.
(2) Many surgical procedures are eliminated.
(3) Some deformities can be corrected.
(4) Beginning deformities can be prevented.

There are many instances where the use of braces is an absolute necessity for the recovery of function in an extremity.

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Celastic Splints

Beatrice F. Schulz, B.S.

The search for a durable, waterproof and lightweight splint for use in the arthritic program led us to experiment with a colloid treated fabric sold under the trade name of "Celastic."*

This material was developed originally as a stiffening for shoe-toes and is now used in a wide variety of applications in the automotive, display, and pattern fields.[1] It has been used in the Veterans Administration in the production of prosthetic appliances "since 1943 when Dr. Mandell Shimberg, then Chief of the Prosthetic Appliance Unit in the New York Regional Office, employed it extensively in orthopedic shop practices and thereby replaced the use of celluloid and other products in the manufacturing of many articles."[2]

Celastic is a napped cotton material impregnated with pyrorylin, a fire resistant, and plastic in the precipitated state. It is purchased in five-yard rolls of fifty-inch width and has the appearance of light grey felt.

To make splints of this material it is necessary to use two other products of the same manufacturer: a solvent which is purchased in five gallon quantities, and secondly, finishing flakes which are purchased in ten pound lots. These flakes are dissolved in the solvent to make the finishing compound. This compound puts a waterproof, smooth surface on the splint and gives it a grayish tan color when thoroughly dry.

We found that it requires about five gallons of solvent to work the five yards of Celastic and make the required amount of finishing compound. The ten pounds of finishing flakes are sufficient to coat at least fifteen or twenty yards of Celastic.

The proportions of solvent and finishing flakes vary as to the method of application. If the compound is painted on the splint, a thinner solution is necessary than if the splint is dipped. For painting the proportions are sixteen tablespoons of flakes to one gallon of solvent. For dipping, use twenty tablespoons of flakes to one gallon of solvent. Allow the mixture to stand several hours or overnight before applying to splints. The compound may be kept indefinitely, although additional solvent may be required, due to evaporation.

Because of the inflammable nature of the solvent as well as the drying action on the skin, it is necessary to exercise several precautions when using these materials:

1. Work in a well-ventilated room.
2. Keep solvent and finishing compound away from open flames.
3. Protect the hands with rubber gloves when working with the solvent.
4. Protect the patient's skin from the moist Celastic during the initial fitting by wrapping the part in oiled or rubberized silk or some nonporous pliable material.
5. Protect clothing, finished wood surfaces and plastics from the solvent.

An ideal work table is one near a window, glass covered and large enough to allow cutting of patterns from the fifty-inch roll of Celastic. It is desirable to have additional space on the table or in cupboards or drawers for the bottles of solvent, finishing compound and flakes, pattern box, tools and accessory supplies.

Equipment needed:

1. Wide mouth gallon glass jar for solvent.
2. One or two wide mouth glass gallon jars for finishing compound.
3. Box or jar for finishing flakes.
4. Two pairs of scissors—four- and six-inch blades.
5. Scalpel (for trimming and cutting ventilation holes).
6. Fine sandpaper for smoothing rough edges and surfaces.
7. Wire to use as hangers for dipping and hanging smaller splints while drying.
8. Paint brushes—one and one and one-half inch.
9. Paper for patterns.
10. A roller is desirable for laminating large surfaces.

Washington University School of Medicine, Division of Physical Therapy, 600 S. Kingshighway, St. Louis 10, Mo.

*Manufacturer: Celastic Corporation, 626 Schulyer Ave., Arlington, N. J.

Procedure: The process of making the splint will vary somewhat with the desired type of splint. If number 125 Celastic is used, it is necessary to apply three or four layers at vital points for large corrective splints as in the case of extreme spasm or contractures of the lower extremity. Two laminated layers generally are sufficient when normal tone or flaccidity is present and correct alignment or prevention of contractures is the objective. One layer often is sufficient for small hand splints and assistive gadgets as pen, fork and spoon holders.

Making the pattern: Make a paper pattern by drawing around the part to be splinted or by taking linear measurements. The measurement method is used primarily when the patient has difficulty holding the part in the position of splinting.

Figure 1. Outlining paper pattern of a two-layer hand splint on Celastic.

A normal part is then used for the general outline and the fitting on the patient follows when the splint is almost dry. When using the tracing method, tucks and wedges may be made in the paper and held in place by adhesive or scotch tape. These wedges and tucks will eliminate some of the excess material where the splint requires angles or curves in more than one plane—and minimize puckering in the Celastic. A slight excess of material may be worked smooth by compressing the wet Celastic with gloved fingers.

Trace or outline the paper pattern with a lead pencil on the Celastic yardage and cut from the roll with large scissors or shears

In many cases, if the same type of splint is used often, one basic pattern may be used with only a few minor changes in width or length.

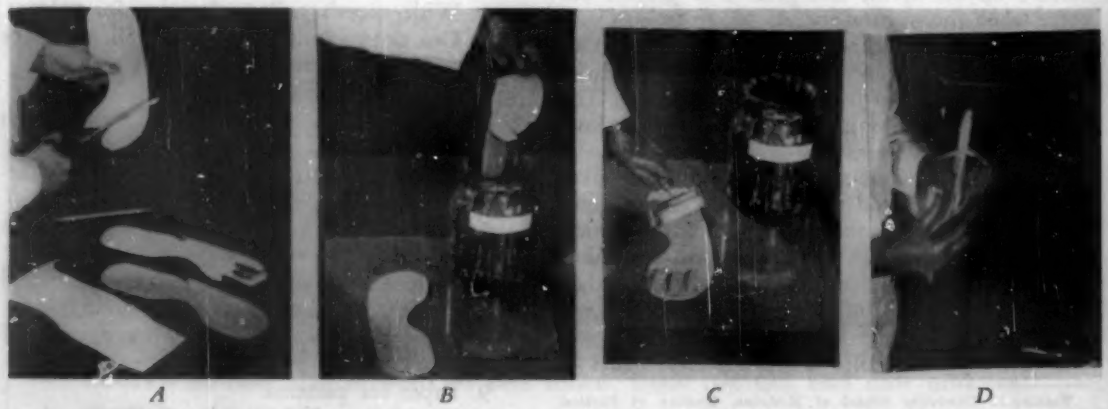
Forming the splint: The number of layers necessary determines the procedure in shaping the splint. When more than two layers are used, it has been found desirable to shape the innermost, or first and second, layers in one step and then add the reinforcements or third and fourth layers after the first two are set, but not necessarily thoroughly dry. Should it be necessary to piece each layer because of extreme size or for convenience in fitting, each layer should be completed before it is laminated to the others, thus reducing the danger of pressure areas where pieces overlap.

Dip the first layer (the one which will touch the part) in the solvent. As the Celastic becomes very pliable as soon as it is wet, most layers can be completely dipped in the wide mouth glass jar of solvent one at a time.

Remove the Celastic as soon as moist—which is almost instantaneously. Allow excessive solvent to drip back into the jar, and then lay the moist Celastic flat on a glass surface or rubberized silk.

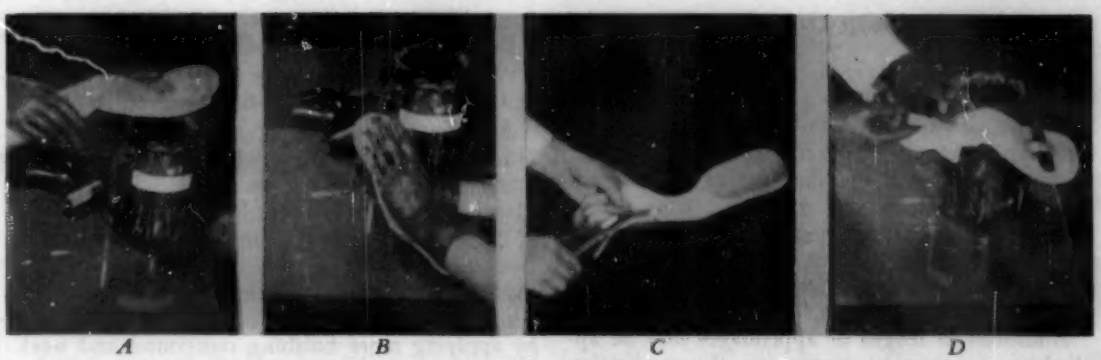
Dip second layer in similar manner. Place second layer on the first and press together with the palm of the gloved hand or with a roller. This will laminate the two layers in a secure and smooth manner.

Allow the laminated layers to dry until they have body enough to hold a slight curve when the edge is rolled. By this time the Celastic has lost its stickiness. The temperature and moisture in the



A B C D

Figure 2. A—Cutting first layer of Celastic. B—Dipping Celastic in solvent (outer layer lying on glass at lower left). C—Laminating the two layers with a roller. Note turned-up finger spacers. D—Laminating and shaping edges.



A B C D

Figure 3. A and B—Initial or rough shaping of splint. C—Trimming edges of partially dry splint. D—Applying strap holders for fingers and wrist.

air will have some influence upon the drying process, but this step will take about ten minutes.

When the laminated layers are raised from the glass surface, some of the nap may be ruffed. This is easily compressed by running the hand or roller over it. A little solvent may be rubbed in with the hand to facilitate the smoothing process. Also if the Celastic has become too dry, it may be remoistened and thus softened by applying a small amount of solvent with a paint brush, particularly at the areas requiring the greatest amount of shaping.

Lay the laminated layers over the part to be shaped, or use a reasonable facsimile, being certain that there are no wrinkles which cannot be compressed out. The skin of the patient had best be protected by rubberized silk or plastic sheeting wrapped snugly around the part. This is primarily to prevent allergies and excessive hair from adhering to the moist splint.

Allow the splint to remain in place until it is well set and can be lifted gently without disturbing the contour. This step may require ten to fifteen minutes. During this drying process the edges may be further compressed and turned slightly outward so as not to exert pressure on the part, wrinkles and depressions should be smoothed out, and lastly excess material may be marked for trimming after the splint is removed.

The splint should not fit tightly as there is some small amount of shrinkage and curling, depending on the size of the splint and direction of the nap.

An old prosthetic or discarded plaster shell is useful for a rough shaping of the splint in the absence of the patient. Changes in the contour can be made when applying the finishing compound or by remoistening the involved areas with solvent.

Allow the splint to dry one hour before applying the first coat of finishing compound. During this time the reinforcement layers may be added to the areas which will be subjected to pressure due to contractions or contractures. Laminate reinforce-

A B C D

Figure 4. A—Dipping one-half of splint in finishing compound. B—Dipping second half of splint in finishing compound. C—Completely dipped splint draining, preparatory to short drying period between fourth and last coats. D—The painting method of applying the finishing compound may be used as an alternative when dipping is not practical.

ments thoroughly. Strap loops also may be added at this time.

Apply the finishing compound either by dipping the splint in the solution or by painting the solution on the splint. Allow the splint to dry thoroughly after the first coat of the compound. The subsequent coat may be applied at half-hour intervals. Some reshaping is possible after any of the applications, but care should be exercised to use gradual pressure when bending, rather than sudden pressure. About five or six coats of compound provide an excellent finish.

Additions in length or appendages may be applied at any time by moistening the application area of the splint and overriding the outer layer of the addition one-half to one inch. The inner layer should be flush with the original inner layer of the splint, thus giving a smooth surface against the patient's skin. Any crack may be sealed by filling it in with finishing compound.

Helpful hints: Edges of reinforcements and layers of different sizes may be made smooth and neat by pressing toward the center of the piece being applied and downward on to the body of the splint.

Cut off the selvage of the yardage, as this is not as well impregnated with plastic and is a different color when dry.

Another type of strap holder may be made by cutting two parallel slashes of appropriate size in the outer layer of the splint before it is soaked in the solvent for the first time. The little strap or loop thus formed is molded into shape by inserting a piece of strap (or cardboard) covered with a finger cot or part of an old rubber glove.

A little roll of Celastic placed between a bar of three thicknesses and about three inches long and the heel of the splint makes an excellent outward rotation obstruction. The roll reinforces the bar where it is most likely to bend.

Make the heel of foot splints as narrow as possible and reinforce with pieces of double thickness on the outer side of the splint on each side of the heel. These reinforcement strips should extend from the center of the instep to a point about four inches above the curve of the heel.

Ventilating holes may be drilled or cut into the splint before applying the finishing compound.

Stationary straps may be riveted into the splint. However, twill straps of one inch width with double pronged buckles are very satisfactory when placed through permanent loops in the splint.

Large cracks may be repaired by moistening the area well with the solvent, adding a reinforcement over the crack and then applying more finishing compound. Small cracks may be repaired by applying more finishing compound and working it into the crack with a gloved fingertip.

Splints may be tinted with oil or tempra paint before applying finish coats. The slight color of the finishing solution should be taken into consideration when mixing the color of the paint.

Metal strips for added strength may be inserted between the layers, as Celastic adheres to metal and wood.

The material is available in several thicknesses, number 125 being the thickest. It has considerably more stretch crosswise than lengthwise. There is some shrinkage which should be taken into consideration when making gadgets or splints circumscribing a part. The lengthwise shrinkage is about 3 per cent, crosswise shrinkage 1½ per cent, and thickness shrinkage, 20 per cent. These percentages were obtained by measuring the material after it had dried without any tension whatsoever.

The average cost of material is less than one-half cent per square inch. This figure includes all materials and a minimum amount of waste.

Although there are some "tricks in the trade" as mentioned above, Celastic is proving to be a satisfactory answer to the demand for splints which are durable, waterproof, light weight and adjustable that can be made at a moderate cost.

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2. Snow, Major Burke M.: The Use of Celastic in Orthopedic and Prosthetic Practice (unpublished). Atlas Project.

A Tilt Table

Andrey W. Stevenson, M.D.

The need for some suitable apparatus for rehabilitation of a patient from a prolonged supine to the upright position prompted the construction of a tilt table at this institution. The basic principle and requirements were outlined by the Consultant in Physical Medicine* in conjunction with the Supervisor of Physical Therapy. The resultant plans† were presented to the maintenance shop for construction. This table, of necessity, must be fool proof in safety features, cheaply and simply constructed. For practical reasons, the table should be the same height as the stretchers, be freely movable, have a central fulcrum for the tilt top and, in general, be carefully balanced. The top must be of adequate length and width to handle all patient sizes. The headrest and the footrest must therefore be adjustable to facilitate placing the center of gravity of any patient over the fulcrum.

Forty-five degrees was arbitrarily set as the maximum tilt needed in our department. With these features in mind, tentative drawings were made and a model constructed. Finding a mechanical hoist for the table top that would maintain the tilt at any angle without slipping proved most difficult. Hydraulic lifts were considered and discarded because of the minimal chance of failure in this mechanism. A screw type automobile jack was found to be the desired element because it was readily available, was cheap and could be controlled by introducing a handle to the end of the screw spindle. Five-ply plywood was used for the structure with reinforcements that are available in any hospital maintenance department. Other than the automobile jack, no special purchases were made.

The final construction is shown in Figures 1 and 2. The table has been in daily use since its

Figure 1.

Figure 2.

Department of Physical Medicine, New York State Rehabilitation Hospital, West Haverstraw, N. Y. *Dr. Morton Hoberman.

†Specifications for the construction of this tilt table may be obtained upon request from the author, whose address is given above.

inclusion in the department and has become invaluable in rehabilitating patients from the prone to the erect position. It can be used in small departments as an extra treatment table and is especially effective in giving lower extremity vascular exercises along with heel cord stretching, using the patient's body weight. It would not be difficult to find other uses for this type of table. This presentation is made in the hope that it will help in the construction of a tilt table for other physical therapy departments, especially in smaller hospitals. We know that it will help immeasurably in rehabilitating the balance mechanism and further ambulation, and certainly will diminish the physical efforts which otherwise would have to be expended by the physical therapists. We are now incorporating some minor changes in the construction of another table, including submersion of the fixation bars on the table top so they will be flush with the surface.

Reminiscenses of Dr. Joseph Bell: The Prototype of Sherlock Holmes

By J. Gordon Wilson, M.D.

Conan Doyle, the famous author of Sherlock Holmes' stories, entered as a student in Edinburgh Medical School in 1876, at the age of 17. He was well acquainted with the pecuniary hardships his mother was facing on his behalf, and set himself as far as possible to lessen her privations by doing odd jobs. It was under these circumstances that he began the career of short story writing, which was ultimately to make him famous, using what he had learned in the clinic and observations made while working with Dr. Joseph Bell. In addition he assisted busy practitioners in their surgeries, dispensing medicine to patients and even visiting the convalescent or very poor. For instance, as a third-year student he would assist doctors in busy practices by filling bottles of medicine in their dispensaries in the evenings and during the holidays. As he approached his final year the family affairs became worse; his father's failing health compelled retirement from work and Doyle found himself the financial head of the family. To lighten the family burden he took a trip to the Arctic as a surgeon on a whaler, returning with fifty pounds in his pocket.

In his memories of Edinburgh, Doyle says, "For some reason which I have never understood Bell singled me out from the drove of students who frequented his wards and made me his outpatient clerk, which meant that I had to array his outpatients, make simple notes of their cases, and show them in, one by one, to the amphitheater in which Bell sat in state surrounded by his dressers and students. This gave ample opportunity to study Doctor Bell's methods and especially his skill in noticing apparent trifles so that he often learned more of the patients by a few quick glances than I had done by my questions. With regard to trifles Bell would say, 'I think every good teacher, if he is to make his men good doctors, must get them to cultivate the habit of noticing apparent trifles.'" Occasionally Doctor Bell's results were very dramatic, though there were times when he blundered. The following is a typical example of the procedure quoted by Doyle. "Bell said to a civilian patient, 'Well, my man, you've served in the Army.' 'Aye, sir.' 'Not long discharged?' 'Aye, sir.' 'A non-com. officer?' 'Aye, sir.' 'Stationed at Barbados?' 'Aye, sir.' 'You see, gentlemen,' Bell explained, 'The man is a respectful man, yet did not remove his hat. They do not in the Army, but he would have learned civilian ways had he been long discharged. He has an air of authority and he is obviously Scottish. As to Barbados, his complaint is elephantiasis, which is West Indian and not British.' To his audience of Watsons," says Doyle, "it all seemed very miraculous until it was explained, and then it became simple enough. It is no wonder that after the study of such a character I used and amplified his methods when in later life I tried to build up a scientific detective who solved cases on its own merits and not through the folly of criminals.

"When I took over his outpatient work he warned me that a knowledge of Scottish idioms was necessary, and I, with the confidence of youth, declared that I had got it. The sequel was amusing. On one of the first days an old man came who, in response to my question, declared that he had a 'bealin' in his 'oxter.' This fairly beat me, much to Bell's amusement. It seems that the words meant an abscess in the armpit."

From Quarterly Bulletin, Northwestern University Medical School, Summer Quarter, 1948.

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Univ. of Colorado Med. Center, Denver[1]	Harold Dinken	Mary Lawrence	a-b-d	12	Sept	$300	Cert. or Degree
ILLINOIS							
Northwestern Univ. Med. School, Chicago	John S. Coulter	Gertrude Beard	a-b-d-e	12	Oct	$450	Cert.
IOWA							
Univ. of Iowa Med. School, Iowa City[1]	W. D. Paul	Olive C. Farr	a[6]-e	12	Sept	$200	Cert.
KANSAS							
Univ. of Kansas, School of Med., Kansas City[1]	Donald L. Rose	Lilyan G. Warner & Ruth Monteith	a-b-d-g	12	Feb Sept	$80[2]	Cert. or Degree
MASSACHUSETTS							
Bouve-Boston School of Phys. Educ., Boston	Howard Moore	Constance K. Greene	g	36	Sept	$550	Degree
Simmons College, Boston	Wm. T. Green / Arthur L. Watkins	Janet B. Merrill	a[6]-b-d-g	16-36	Sept	$650	Cert. or Degree
Boston Univ. College of Phys. Ed. for Women: Sargent College, Cambridge	Kenneth Christophe	Adelaide McGarrett	a-b-d-f-g	12 4 yrs.	Sept	$495	Cert. or Degree
MINNESOTA							
Univ. of Minnesota, Minneapolis[1]	Miland E. Knapp	Ruby M. Green	d-f-g	2 yrs.	Sept	$126[2]	Degree
Mayo Clinic, Rochester[1]	Earl C. Elkins	Harry Keown	a-b-c	12	Sept	None	Cert.
MISSOURI							
Washington Univ. School of Medicine, Barnes Hospital, St. Louis[1]	Sedgwick Mead	Beatrice F. Schulz	f	2 yrs.	Sept	$400[4]	Degree
St. Louis Univ. School of Nursing, St. Louis[1]	A. J. Kotkis	Sr. Mary Imelda	g	36	Jan Sept	$300	Degree
NEW YORK							
Albany Hospital, Albany	John W. Ghormley	Catherine Graham	a-b-d	12	Sept	$250	Cert.
Columbia Univ., New York[1]	Wm. B. Snow	Floy Pinkerton	a-c-f	1 or 2 yrs.	Sept	$450	Cert. or Degree
New York Univ. School of Education, New York[1]	George G. Deaver	Elizabeth C. Addoms	a[6]-b-d-g	12	Sept	$589	Cert. or Degree
NORTH CAROLINA							
Duke Univ. School of Med., Durham[1]	Lenox Baker	Helen Kaiser	a[6]-b[6]-d	15	Oct	$300	Cert.
OHIO							
Cleveland Clinic, Cleveland	S. G. Gamble	Anna Wetterhuus	a-b-d	12	Jan	$200	Cert.
PENNSYLVANIA							
D. T. Watson School of Physical Therapy, Leetsdale[1]	Jessie Wright	Kathryn Kelley	a[6]-b[6]-d	12	Oct	$300	Diploma
Graduate Hospital, Univ. of Pa., Philadelphia[1]	George M. Piersol	Dorothy Baethke	a-b[6]-e	12	Sept	$400	Cert.
TEXAS							
Hermann Hospital, School of Physical Therapy, Houston[1]	Oscar O. Selke, Jr.	Mary Elizabeth Kolb	a-b-d	12	Oct	$300	Cert. or Degree
Univ. of Texas School of Med., Galveston[1]	G. W. N. Eggers	Ruby Decker	a-b-d	12	Jan	$163[2]	Cert.
VIRGINIA							
Baruch Center of Physical Med. of Medical College of Virginia, Richmond[1]	Walter J. Lee	Susanne Hirt	a-b-c-g	12	Sept	$275[2]	Cert. or Degree
WISCONSIN							
Univ. of Wisconsin Med. School, Madison[1]	Harry D. Bouman	Margaret Kohli	a-b-f-g	12	Sept	$150[2]	Cert. or Degree
MEDICAL DEPARTMENT—U. S. ARMY							
(a) Medical Field Service School, Brooke Army Medical Center, San Antonio, Texas, and	James E. Tate, Lt. Col., M.C.	Agnes P. Snyder, Major, WMSC	b-e	12[5]	Nov	None	Cert.
(b) Fitzsimons General Hospital, Denver, Colorado, or	H. B. Luscombe, Colonel, M.C.	Elsie Kuraner, Major, WMSC	Completion of Medical Field Service School				
(c) Walter Reed General Hospital, Army Medical Center, Washington, D. C.	Emmett M. Smith, Colonel, M.C.	Barbara Robertson, Captain, WMSC	Completion of Medical Field Service School				

Entrance Requirements

For One Year Course: a = Graduation from accredited school of nursing; b = Baccalaureate degree with major in Physical Education; c = Two years of college with science courses; d = Three years of college with science courses; e = Baccalaureate degree with required science courses.

For Two Year Course: f = Two years of college with science courses.

For Four Year Degree Course: g = High school graduation.

[1]Male students admitted.
[2]Nonresidents charged additional fee.
[3]Certificate granted by Childrens Hospital Society; degree granted by University of California at Los Angeles.
[4]Tuition reduced second semester of second year.
[5]12 months includes training at the Medical Field Service School and Fitzsimons or Walter Reed General Hospitals.
[6]Additional college science required.

Editorials

Most physical therapists are aware of the need for more qualified workers in their field. Those who have been in areas which suffered a great increase in the incidence of poliomyelitis found through trying experience that there just aren't enough physical therapists to go around. However, many are not acquainted with the factors involved in trying to solve the problem.

Back in 1941 when there were only about 1400 physical therapists there was no appreciable shortage, but today with over 4000 there is a definite and severe shortage. This is plainly due, then, to increased demand. During the war years countless GIs had their first contact with physical therapy, thus bringing home with them a knowledge of its value and an understanding of its use. Likewise, many physicians in the medical corps had their first real experience in the use of physical therapy. The wide use of physical therapists in the treatment of poliomyelitis has further educated the public.

All of this is reflected in the great demands we are now facing. We have the responsibility of meeting these demands and the answer is clearly to increase the supply. This responsibility has long been recognized by our national and state organizations and great effort has been made to promote recruitment of students. We are all familiar with the exhibits and informational literature produced by our national staff. Along with increasing the interest in physical therapy as a profession we must give thought to provision of adequate training facilities. Those who have no direct contact with schools may fail to recognize the importance of this factor.

Finally, we must seriously consider the type of person who is to be drawn into our profession. Attention must be given to prerequisite standards and they must be such as to attract those with excellent backgrounds. We must not be satisfied with the minimal requirements of past years. As the standards of our new physical therapists are raised, so are the standards of the profession as a whole elevated. Each one of us can assist by becoming interested in the school programs and by helping to stimulate interest among those who are well equipped to enter a respected and worthwhile profession.

Physical Therapist

The Council on Medical Education and Hospitals of the American Medical Association met in Chicago in October. The Council approved the term *physical therapist* in its "Essentials." The title now reads "Essentials of a School of Physical Therapy." All reference to *technicians* in the body of the "Essentials" has been omitted. The revisions now go to the House of Delegates of the American Medical Association for approval. When the revised copy of the "Essentials" is received it will be published in its entirety in the REVIEW.

Association Activities

The 1950 Conference

"Come to Cleveland for the Conference" are the new lyrics we'll be singing when "June comes bustin' out all over," in 1950.

Haven't some of the details of those "book-learnin' " sessions slipped back into the dusty pigeonholes of your brain? Don't you want to hear the newest theories on the old baffling problems? Then the annual conference is the answer!

What has become of your classmates, and the professional cohorts of the years gone by? You'll see them, and catch up on all the gossip, while you're "on the town," if you save your spare change this winter, and "Come to Cleveland for the Conference."

—ALICE KINGMAN, *Chairman*
Northern Ohio Chapter
Public Relations Committee

National Office Field Trips

Miss Elson

Albany—Eastern New York Chapter Meeting
Boston—Massachusetts Chapter Executive Com-

mittee Meeting and Massachusetts Chapter Polio Recruitment Committee Meeting

Miss Haskell

Boston—Massachusetts Chapter Polio Recruitment Committee Meeting

Miss Carlin

Chicago—Meeting of Subcommittee on Essentials, Committee on Medical Education and Hospitals, American Medical Association (See item on "Physical Therapist," page 550).
Northwestern University Medical School

Madison—University of Wisconsin

Public Health Meeting

The seventy-seventh annual meeting of the American Public Health Association was held in New York, October 24-28. Mildred Elson, Jane Carlin and Lois Ransom attended selected meetings and various members of the New York Chapter participated in the program.

Doctor Reggio Retires

Dr. A. William Reggio, a member of our Advisory Council, retired from his position of Chief, Physical Medicine and Rehabilitation Section, Division of Hospitals, United States Public Health Service, Washington, D. C., November 17, 1949.

This section was created in 1945 and Doctor Reggio has done much to develop it. One of his special projects has been the establishment of a coordinated physical therapy and occupational therapy program at the national leprosarium, Carville, Louisiana.

Doctor Reggio will live in Medfield, Massachusetts, and will continue his interest and activities in the field of rehabilitation.

Membership News

Personals

• Mary Eleanor Brown is now on the staff of the Eastern New York Orthopedic Hospital, Schenectady, and is presently assigned to the State of New York Division of Medical Services as Physical Therapy Consultant in Cerebral Palsy.

• Mildred Elson, Catherine Worthingham, Clara Marie Arrington and Louise Suchomel were among the guests of honor at the Physical Therapy-Occupational Therapy Luncheon during the 1949 annual convention of the National Society for Crippled Children and Adults, Inc., held in New York, November 6-10. This luncheon was attended by approximately 125 physical therapists, occupational therapists and physicians, including Miss Firth, physical therapist from New South Wales, and Miss Saywell, physical therapist from England.

• Evelyn Anderson May, former Secretary of the Association and Executive-Secretary from May to August 1944, has returned after five years in England. Dr. Philip May, her husband, has accepted a post at the University of Colorado, Denver.

Mrs. May spent a year in physical therapy graduate study in teaching centers in London. Her particular interest is physical therapy in chest conditions. She has worked at the Brampton Hospital, world famous chest center, for the past two and a half years.

• Gertrude Mensch of Liberty, Kansas, recently joined the physical therapy staff at the Veterans Hospital, Oteen, N. C.

• Celeste H. Hayden went to Raleigh, N. C., in September to take over the duties of Physical Therapy Consultant for the Crippled Children's Department of the State Board of Health.

Marriages:

Lois J. Allen is now Mrs. Lois A. Coleman of Santa Monica, California.

Captain Mildred Carter is now Captain Mildred C. Duffy of San Francisco, California.

Margaret E. Jones is now Mrs. Jack Stevenson Neal of Evanston, Illinois.

Ruth M. Loverude and Robert C. Meade, recent graduates of the Graduate Hospital of the University of Pennsylvania, were married and are both employed at Hines General Hospital, Hines, Illinois.

Mary Sydney Martin is now Mrs. David F. Baker of Seaford, Delaware.

Elizabeth Masola is now Mrs. Elizabeth M. Glomb of Cleveland, Ohio.

Margaret Jean McDaniel is now Mrs. Moreland D. Richmond of San Francisco, California.

Arminta Roberts is now Mrs. W. J. Hill of Seattle, Washington.

Nancy Sargeant is now Mrs. Carl L. Hemmer of Indianapolis, Indiana.

Kathleen A. Stewart is now Mrs. Howard C. Poulter of Oakland, California.

Mary K. Taylor is now Mrs. David Townsend of Jonesboro, Arkansas.

Eleanor K. Wood is now Mrs. George Long of Indianapolis, Indiana.

Chapter Activities

• *Carolina Chapter:* At its semi-annual meeting, November 11 to 13, 1949, Columbia, S. C., the Carolina Chapter held a program and symposium on "A Coordinated Diagnostic and Therapeutic Program for a Cerebral Palsy School."

• *Connecticut Chapter:* The Connecticut Chapter held their Fall meeting on September 2, with Mildred Elson as guest speaker.

• *Illinois Chapter:* International Altrusa Magazine recently published an article entitled "Physical Therapy as a Career" by Viola Bryson, President of the Illinois Chapter.

At the October meeting of the Illinois Chapter, held at Mercy Hospital, reports of the 1949 Annual Conference were given. Colored movies of the Mercy Hospital Cerebral Palsy Clinic were shown, after which there was a tour of the Physical Therapy Department.

At the November meeting Vernon Turner, M.D., Orthopedic Surgeon, spoke on "Patients with Aching Backs."

• *Maryland Chapter:* The Maryland Chapter planned a series of lectures on anatomy, physiology, pathology and treatment of lesions of the central nervous system. At the November meeting, A. Earl Walker, M.D., Professor of Neurological Surgery, Neurological Surgeon-in-Chief, Johns Hopkins University and School of Medicine, presented lecture three on "Surgery in Lesions of the Central Nervous System."

• *Western Pennsylvania:* The September meeting of the Western Pennsylvania Chapter was held at the D. T. Watson Home for Crippled Children, Leetsdale. The student members had complete charge of the program and presented a symposium on cerebral palsy. Guests included a large number of members of various allied agencies.

• *West Virginia Chapter:* At its two-day Fall meeting the West Virginia Chapter had as guest speakers R. L. Anderson, M.D., who spoke on "Mechanics of the Shoulder," H. M. Hills, M.D., who discussed "Fractures of the Hand," and Mr. Fred Thompson who is associated with the Hanger Limb Company of Charleston and who spoke on "The Construction of Artificial Limbs and Suction Sockets."

School Notes

One Hundred Per Centers

The November issue of the REVIEW mentioned the graduating class of the Graduate Hospital of the University of Pennsylvania as being 100 per cent active members of the American Physical Therapy Association. Again this school has joined the ranks. At the end of two weeks of school the class are 100 per cent student members.

How many other 100 per centers do we have?

New Members

• The following are newly accepted members of the American Physical Therapy Association:

Marjorie R. Cacner
Louise M. D'Ercole
Nancy B. DeWolf
Joseph Gibbons
Blanca Gonzales
Janet M. Hafer
Mrs. Jacqueline Heneage
W. Jane Hudson (Foreign trained)
David Kaskowitz
Janet Kelly
Nancy Killam
Helen Lepida
Alta McDermott
Annette H. Peraya
Marie M. Rieman
Helen Franklin Schroeder
Sister Mary Tarcisius
Hoffman
Mrs. Sylvia D. Thaler
Michael Virgadamo

Associate Member: H. O. Marsh, M.D., Medical Director, Wichita Institute of Logopedics.

• Recent graduates and former student members of the following schools:

Barnes Hospital:
Jack E. Field
Natalie A. McFee
William M. Merritt
Thomas J. Zwierlein

Columbia University:
Celeste F. Nodell

New York University:
Demetrius Babiak
Henrietta Berenson
Arthur T. Brown
Anthony DeRosa
Carlton L. Jones
Lazarus L. Kalman
Mortimer Lefkowitz
Doris Leventhal
Annette Mark
Eleanor Pantalone
Ruth Schulman
Lucian Zadrozny

Northwestern University Medical School:
Frances Berresheim
Alda L. Bevan
Miriam Blitstein
Frances Case
Graciela Cestero
Anita J. Chase
Josephine Gardner
Ariel M. Glick
Mrs. Margaret J. Neal
Jacqueline A. Major
Elizabeth McKown
Alice L. Santistevan
Dorothy T. Schmugge
Elizabeth Schnake
Helen Stringer

Stanford University:
Mrs. Mary K. Blakeman
Mary C. Hopkins
Margot Trimble

University of Colorado:
John Nygaard
John S. Salyards
Myrtle E. Swanson
Betty Toliver

University of Kansas:
Wilma M. Martin

University of Wisconsin:
Mrs. Jewell G. Heckrotte
Hilda M. Heikkila
Signe S. Heikkila
Lois Latsch

Student Members

The following are new student members of the following schools:

Barnes Hospital:

Kathryn Abrams	Dan Rapaich
Marie Anne Brown	Helen C. Schultz
Audrey Chambless	Nancy Schumacher
Melody J. Engleman	Ione J. Stroup
Donna J. Epps	Muriel J. Wallace
Ronald M. Oba	Donald E. Wasson

Baruch Center, Medical College of Virginia:

Edward L. Herman	Alma F. Martin
Carl N. Lloyd	Charles T. Musto

Children's Hospital, Los Angeles:

Carolyn A. Coghlan	Walter J. Jadeson
Marilyn L. Croxford	Barbara L. Jenks
Robert G. Dicus	Joetta M. Lyon
Harold Feldman	Clarice E. Satre
Mrs. Fern H. Giessman	Mrs. Lucille D. Skophamm
Ethel L. Henry	Cora B. Sunetaro
Fern A. Horine	Shigeko C. Tanaka (Miss)

Sargent College:

Greta Andrews	Patricia McCann
Paula Beaudoin	Anita M. McKenzie
Eleanor Beck	Joan Morrow
Flora Candella	Doris M. Novack
Harriet Cryan	Barbara O'Brien
Janet Hoover	Angela Paglianete
Sheila Job	Dorothy Paxton
Marcia Kaufman	Lois Reiser
Georgia Keefer	Rita Romano
Barbara M. Lake	Mary Schubert
Nancy Lewis	Catherine Solenberger
Barbara Liggett	Janis Tyler
Joan Lint	Betty Wersebe
Nancy Maher	Lillian Webber
Ellen Marshall	Mildred Wordell
Nancy Matthews	

University of Minnesota:

Cornelia A. Burrill	Dorothy E. Mitchell
Geraldine Ghent	Faye P. Peterson
Howard A. Haak	Jacquelyn A. Peterson
Barbara Ann Hario	Eugenia M. Pierce
Barbara J. Lee	Lorraine M. Stone

University of Southern California:

Edward R. Blodgett	Mrs. Eillen G. Lynn
Ruth I. Caraway	Katherine J. Martin
Joanne Conklin	Helen Melroe
Mary L. Dodge	F. Eugene Miller
William G. Hunt	Viola Robins
Lawrence J. King	Gerard E. Stavish
Thomas B. King	Irvin F. Travis
Frances Koerner	Mrs. Margaret M. Wallace
Irene M. Leaman	

Correction: An error occurred in the listing of new members in the November 1949 issue of the REVIEW. Mrs. Pauline F. Bowen, Mr. Luz Maria Lopetegui and Archibald Simons are recent graduates and former student members of the University of Pennsylvania; all the remaining persons listed under the University of Pennsylvania and all those listed under the Baruch Center of Physical Medicine, Medical College of Virginia, are new *student* members.

Obituaries

• **Edna Ohlsen,** graduate of the University of Minnesota 1946, American Physical Therapy Association member since 1946, died in Fort Worth, Texas, October 25, 1949.

• **Nola O'Connor Kuhne,** graduate of the Mayo Clinic 1942, American Physical Therapy Association member since 1942, died September 1949.

• **Mrs. Helen Heardman,** Chartered Society of Physiotherapy, visited this country in the Fall of 1947 and probably is known to more physical therapists as the author of "A Way to Natural Childbirth." We have just received word of her death in England.

• **Connie Beattie**—In the September issue of the REVIEW was a story about Connie Beattie, the Canadian physical therapist, voluntarily working in the Arctic. It is with regret that we quote the following from THE JOURNAL OF THE CANADIAN PHYSIOTHERAPY ASSOCIATION:

"It was the Indian Affairs Branch of the Health Department in Ottawa who asked for a physio to undertake this arduous mission in the vast northern area which was under quarantine for polio. Connie cheerfully accepted. She flew to Chesterfield Inlet, 400 miles inside the Arctic circle, and for nearly four months treated Eskimo polio patients under extremely difficult, almost primitive, conditions.

"On a Sunday evening in the wild, rugged country between Winnipeg and Churchill, a Canso aircraft of the R.C.A.F. crashed. All 20 persons aboard perished. Connie Beattie was among the victims. She was flying out to Winnipeg, with seven of her Eskimo patients.

"Connie died on duty. She was only 24. She was the first casualty in service among the members of the Association."

General News

American Academy for Cerebral Palsy

The American Academy for Cerebral Palsy announces that its annual meeting will be held in New York City at the Waldorf-Astoria Hotel on Friday and Saturday, February 17 and 18, 1950, immediately following the meeting of the American Academy of Orthopaedics.

Scientific sessions will be open to visiting ortho-

pedic men and any other physicians interested in the problem of cerebral palsy. These sessions will be on Friday, February 17, from 2:00 to 5:00, and on Saturday morning, February 18, from 9:00 to 12:00. All phases of cerebral palsy will be discussed.

• At a recent meeting of the Pennsylvania Academy of Physical Medicine the following officers were elected for the ensuing year: President—William Schmidt, M.D.; Vice-President—H. L. Rudolph, M.D., and Secretary—Herman Bearzy, M.D.

Coming Meetings

Date	Organization	Place
Feb. 17-18, 1950	American Academy for Cerebral Palsy	Waldorf-Astoria Hotel, New York, N. Y.
June 25-30, 1950	American Physical Therapy Association	Hotel Statler, Cleveland, Ohio

Index to Current Literature

Administration and Organization

Administration of a Medical Rehabilitation Service in a Neuropsychiatric Hospital. Daniel Dancik. Archives of Physical Medicine, October 1949.

Review of 1949 Hospital Salaries. Hospitals, November 1949.

Anterior Poliomyelitis

Treatment of the Convalescent "Polio" Patient. H. V. Cranfield. Journal of the Canadian Physiotherapy Association, September 1949.

The Value of the Laboratory in the Diagnosis of Poliomyelitis. Max J. Fox and Hobart E. Wallace. American Journal of Medical Sciences, April 1949.

Apparatus

Spring Splint to Supinate or Pronate the Hand. Sterling Bunnell. Journal of Bone and Joint Surgery, July 1949.

Arthritis

Prolonged Treatment of Rheumatoid Arthritis with ACTH. David E. Markson. Journal of the American Medical Association, October 15, 1949.

Cerebral Palsy

Treatment of Cerebral Palsy (Dr. Earl Carlson's Address). British Medical Journal, October 1, 1949.

Diathermy

Alterations in Peripheral Circulation and Tissue Temperature Following Local Application of Short Wave Diathermy. Herman J. Flax, Ruth N. Miller and Steven M. Horvath. Archives of Physical Medicine, October 1949.

Effect of Diathermy (Short Wave and Microwave) on Bone Growth in the Albino Rat. Charles S. Wise, Benjamin Castleman and Arthur L. Watkins. Journal of Bone and Joint Surgery, July 1949.

Education

Educational Problems in Physical Medicine and Rehabilitation. Earl C. Elkins. Archives of Physical Medicine, October 1949.

Federal Training Programs for Hospital Personnel. William T. Doran. Hospitals, October 1949.

Electrotherapy

Some Aspects of Electrodiagnosis and Electrotherapy in the Royal Air Force. E. F. Mason. Proceedings of the Royal Society of Medicine, August 1949.

Fractures

Multiple Fractures. Otho C. Hudson. Medical Times, October 1949.

Geriatrics

Chronic Disease and an Aging Population. Howard A. Rusk. Medical Woman's Journal, September 1949.

Midcentury White House Conference on Children

1. *The Task of the National Committee.* Oscar Ewing.
2. *Focus on Child's Mental, Emotional and Spiritual Growth and Development.* Melvin A. Glasser.

Both the above in The Child, October 1949.

Miscellaneous

Sawdust Bed Therapy. American Journal of Nursing, October 1949.

Section on Physical Medicine, L. C. Hill. Proceedings of the Royal Society of Medicine, August 1949.

Engineering Methods in Occupational Therapy and Industrial Rehabilitation. A. R. Thompson. Industrial Medicine and Surgery, September 1949.

Familial Periodic Paralysis. Dewey K. Ziegler. Archives of Internal Medicine, September 1949.

Histamine Iontophoresis in the Therapy of Multiple Sclerosis. Harold A. Abramson. New York State Journal of Medicine, May 15, 1949.

New Radioactive Isotope for Bone Cancer. New York State Journal of Medicine, August 15, 1949.

Notes of Experiments Illustrating Normal Temperature Regulation in Young Men. Samson Wright. British Medical Journal, April 9, 1949.

Use of Radioactive Iodine in Treatment of Graves' Disease. M. Prinzmetal, C. M. Agress, H. C. Bergman and B. Simkin. California Medicine, April 1949.

The Heat of Activation and the Heat of Shortening in a Muscle Twitch. A. V. Hill. Proceedings of the Royal Society, June 23, 1949.

Method for the Frequent Estimation of Forearm Blood Flow Under Conditions of Decreased Atmospheric Pressure. D. McK. Kerslake. Journal of Physiology, June 15, 1949.

Orthopedics

The Diagnosis and Treatment of "Mechanical Backache." George S. Phalen. Journal of the American Medical Association, October 15, 1949.

Electromyography in Orthopedics. Arthur L. Watkins. Journal of Bone and Joint Surgery, October 1949.

Vitallium-Cup Arthroplasty of the Hip Joint. Alexander Gibson. Journal of Bone and Joint Surgery, October 1949.

Peripheral Vascular Diseases

The Diagnosis and Treatment of Vascular Diseases. R. H. Goetz. British Journal of Surgery, July 1949.

Public Health

A Community Home Care Program. Martin Cherkasky. American Journal of Nursing, October 1949.

Rehabilitation

Rehabilitation (Dr. Howard Rusk's address). British Medical Journal, October 8, 1949.

The Rehabilitation of the Amputee. George G. Deaver and Earle H. Daniel. Archives of Physical Medicine, October 1949.

Rehabilitation in Small Communities. Shelby Gamble. Ohio State Medical Journal, September 1949.

A Step Toward Better Vocational Rehabilitation. Charlotte R. Bursmeister. Public Health Nursing, November 1949.

Requirements for an Effective Rehabilitation Program. Hospitals, November 1, 1949.

Rehabilitation of the Handicapped: A Symposium. Industrial Bulletin, New York State Department of Labor, New York City, October 1949.

Reports

Reports of the Council on Physical Medicine and Rehabilitation. Journal of the American Medical Association (pages 658 and 676), November 5, 1949.

Therapeutic Exercise

The Use of the Technic of Progressive-Resistance Exercise in Adolescence. J. Roswell Gallagher and Thomas L. DeLorme. Journal of Bone and Joint Surgery, October 1949.

Ultraviolet Radiation

Effects of Ultraviolet Radiation on the Exposed Brain. Arthur R. Elvidge and Arthur A. Morris. Archives of Neurology and Psychiatry, August 1949.

Reprints Available

One free copy of each scientific reprint (except the History of the American Physical Therapy Association, and the Anterior Poliomyelitis and Cerebral Palsy Issues of the REVIEW will be provided upon request to all members, students in the approved schools and libraries. A small charge is made as indicated for additional copies to members, students and libraries, and for all copies to nonmembers. The informational brochures are available to all without charge. To obtain reprints write: American Physical Therapy Association, 1790 Broadway, New York 19, N. Y.

PHYSICAL THERAPY, A SERVICE AND A CAREER

An illustrated brochure, describing the opportunities for a career in physical therapy, available scholarships and educational requirements for entering a school of physical therapy. (Made available through National Foundation for Infantile Paralysis funds.)

OUR ASSOCIATION

An informational booklet on the activities, scope and services of the American Physical Therapy Association.

PHYSICAL THERAPY

A question and answer article covering the usual queries received on physical therapy.

PHYSICAL THERAPY—*Suggestions for Prospective Students.*

Outlines the professional course of study for college students preparing for physical therapy.

CODE OF ETHICS

Ethics for the physical therapist of the American Physical Therapy Association.

PERSONNEL POLICIES FOR QUALIFIED PHYSICAL THERAPISTS

Suggestions as to salary, hours, vacations, etc., by the American Physical Therapy Association.

NEW HORIZONS AND NEW RESPONSIBILITIES FOR THE PHYSICAL THERAPIST.

HOWARD A. RUSK, M.D.

UNDERLYING MECHANISMS IN SYMPTOMS OF POLIOMYELITIS: *Their Bearing Upon Treatment.*

THOMAS GUCKER, 3RD, M.D.

APPROVED SCHOOLS OF PHYSICAL THERAPY

A list of schools approved by the Council on Medical Education and Hospitals of the American Medical Association.

EDUCATIONAL OPPORTUNITIES FOR PHYSICAL THERAPISTS

A list of postgraduate programs offered by the approved schools and a list of specialized courses for physical therapists.

POSTURE TRAINING FOR ADOLESCENTS

CAROLYN BOWEN (5c)

PHYSICAL THERAPY IN THE TREATMENT OF RHEUMATOID ARTHRITIS.

MARY E. NESBITT. (5c)

MARIE-STRUMPELL ARTHRITIS: *With Emphasis on a Physical Therapy Regime.*

LUCILE NIEHUS. (10c)

EMOTIONAL FACTORS IN RHEUMATOID ARTHRITIS: *Their Bearing on the Care and Rehabilitation of the Patient.*

ALFRED O. LUDWIG, M.D. (10c)

PASSIVE AND ACTIVE STRETCHING OF MUSCLES: *Spring Stretch and Control Group.*

SONYA WEBER, D.Sc., AND HANS KRAUS, M.D. (5c)

INTERDEPARTMENTAL RELATIONS OF ANCILLARY MEDICAL SERVICES: *With Special Reference to Physical Therapy.*
R. J. STULL. (10c)

INTEGRATION OF PRINCIPLES OF BODY MECHANICS AND POSTURE IN NURSING: *Demonstration Project at Vanderbilt University School of Nursing.*
MARGARET C. WINTERS. (10c)

PHYSICAL THERAPY AND CHEST SURGERY
FLORENCE S. LINDUFF. (10c)

PHYSICAL THERAPY MANAGEMENT OF LOWER EXTREMITY AMPUTEES.
PAIGE WEAVER. (10c)

TOYS, GAMES AND APPARATUS FOR CHILDREN WITH CEREBRAL PALSY.
GLADYS G. ROGERS AND LEAH THOMAS. (10c)

ANTERIOR POLIOMYELITIS: *Rehabilitation by Functional Exercises.*
EMIL D. W. HAUSER, M.D. (10c)

GUTHRIE-SMITH APPARATUS: *Its Construction and Use in Rehabilitation.*
KATHRYN S. BIER. (20c)

THE NEED FOR PHYSICAL THERAPY IN POSTPARTUM CARE.
WILLIE REBECCA HARVEY. (20c)

REHABILITATION OF THE INJURED CHEST.
VICTOR P. SATINSKY, MAJ. MC, AUS, AND DORA DYKINS (20c)

THE MEAUREMENT OF JOINT MOTION.
MARGARET LEE MOORE (25c)

THE PHYSICAL THERAPY REVIEW—*Special Anterior Poliomyelitis Issue.* July-August 1947 (75c)
The magazine contains 11 articles by leading physicians and physical therapists on research and treatment of polio. There are 16 abstracts of articles on polio from current medical journals.

A HISTORY OF THE AMERICAN PHYSICAL THERAPY ASSOCIATION.
IDA M. HAZENHYER. (50c)
An account of the Association's activities and growth from 1921-1946.

THE PHYSICAL THERAPY REVIEW—*Special Cerebral Palsy Issue.* May-June 1948 (75c)
This magazine contains 8 articles by leading physicians and physical therapists on research and treatment of cerebral palsy. There are 5 abstracts of articles on cerebral palsy from current medical journals.

Available free of charge from Joint Orthopedic Nursing Advisory Service, 1790 Broadway, New York 19, N. Y.:

MAKING PHYSICS A PART OF THE CURRICULUM: *Three methods of incorporating physics in the nursing school curriculum.*
HESSEL H. FLITTER, R.N.

THE PATIENT WITH BULBAR-RESPIRATORY POLIOMYELITIS.
FREDERIC J. KOTTKE, M.D., AND WILLIAM G. KUBICEK, PH.D.

Abstracts

John S. Coulter, M.D.

Problems of Aging and Chronic Sickness

A. P. Thomson, M.C., M.D., F.R.C.P., Professor of Therapeutics, University of Birmingham; Physician, United Hospitals, Birmingham. In BRITISH MEDICAL JOURNAL, 4622:8:300, August 6, 1949.

In my first lecture I recalled impressions gathered from a general review of several infirmaries and presented a more detailed analysis of the patients of one large institution. Before discussing the clinical material as a whole I propose to describe some conditions that deserve more attention than they have hitherto received. They fall into four groups; (1) Extreme contractures developing without apparent lesions in either the nervous or the locomotor system. (2) Some peculiar conditions of the feet. (3) Unusual phenomena in the late stages of vascular hemiplegia. (4) Incontinence.

The Suction Socket for Above-Knee Amputees

Paul E. McMaster, M.D., F.A.C.S., and Robert Mazet, Jr., M.D., F.A.C.S., Los Angeles, California. In SURGERY, GYNECOLOGY AND OBSTETRICS, 89:3:335, September 1949.

The suction socket prosthesis for above-knee amputation eliminates pelvic band and shoulder harness. The special construction and fitting cause it to be held on to the stump by a moderate amount of suction. The authors have had an opportunity to observe the fitting and use of more than 60 suction socket prostheses during the training and experimental programs of The Committee on Artificial Limbs of the National Research Council and Veterans Administration, plus observations on private patients.

Tennis Elbow

Leland L. Swenson, M.D., Muskegon, Michigan. In THE JOURNAL OF THE MICHIGAN STATE MEDICAL SOCIETY, 48:8:997, August 1949.

Treatment depends on the severity of the condition. In mild or early acute cases, the patients are instructed in the use of heat on the elbow followed by gentle massage. A sling may be worn; however, it has been our practice to instruct these patients to work with their elbows close to their bodies, not to reach and grasp or do any motion which causes pain. Some writers advocate plaster immobilization, e.g., the use of a cock-splint

(Watson-Jones), or splinting the forearm in neutral with the elbow at ninety degrees (Stack and Hunt).

In the more chronic and severe cases, manipulation under local anesthesia may be employed.

Conclusions

1. Sixty-three cases of "tennis elbow," studied during the period 1946 through 1947, are analyzed.
2. Conservative measures, consisting of heat, massage, rest, and avoidance of motions causing discomfort, are generally successful. These measures are particularly successful in treating medial epicondylitis.
3. Manipulation under local anesthesia was successful in 77 per cent of the cases wherein it was used.
4. Roentgen therapy was 50 per cent successful in four cases.
5. Incision of the conjoined tendon was successful in eight cases that had proven resistant to other forms of therapy and in one case where it was the only therapy employed.

Observations on "Major" and "Minor" Causalgia

Francis Echlin, M.D., Frederick M. Owens, Jr., M.D., and Warner L. Wells, M.D., Montreal, Canada. In the ARCHIVES OF NEUROLOGY AND PSYCHIATRY, 62(2):8:185, August 1949.

Pain is the central feature of causalgia. Vasomotor and trophic changes are variable and for the most part nonspecific. They are not an essential part of the syndrome.

Severe, or major, causalgia resulting from war wounds of large peripheral nerves is commoner than has usually been reported.

The majority of patients with major causalgia show gradual spontaneous improvement.

The classic syndrome of causalgia is seen in its complete form only during the period that the condition is at its height.

As improvement occurs in a case of causalgia, all gradations of intensity in the condition may be seen.

During the period of improvement in a case of severe causalgia, the condition may be described as one of minor causalgia.

Some patients present the picture of a minor causalgia without ever passing through a phase of severe or major causalgia.

Realization that causalgia may exist in a mild, or minor, form is important, as the condition is probably more common in civilian life than generally recognized.

The same abnormal mechanisms are apparently operative in all cases of causalgia, regardless of intensity.

Although gradual improvement is usual in a case of causalgia, this may not take place for months or even years in some cases. In the interval progressive and irreversible changes may occur in the tissues and perhaps even in the emotional stability of the patient. In addition, the patient may be left with a disagreeable minor causalgia. Adequate treatment therefore should be instituted early.

An injured nerve should be appropriately treated on its own merits. Coexisting causalgia may thereby be relieved, especially if neurorrhaphy is the procedure of choice. The individual case of causalgia should be evaluated with respect to its duration, severity and response to the conservative expedients of physical therapy and sympathetic block. These measures failing, sympathectomy should be done in cases of severe causalgia if sympathetic block has given temporary relief. In such circumstances sympathectomy has been curative in the majority of patients, at least during the period of their follow-up.

Facing Realities

M. A. Tarumianz, M.D., Farnhurst, Del. In DELAWARE STATE MEDICAL JOURNAL, 21:8:133, August 1949.

In recent years we have become increasingly aware of the problems of mental health and mental illness. We also recognize the fact that it is necessary to go beyond the problem of the acutely ill for the purpose of prevention. In other words we are concerned now more about mental health of the so-called normal people.

It is true that we have to make all the necessary provisions for early treatment of the recognized acutely mentally ill and that such care and treatment should be established adequately in all public mental hospitals as well as in large general hospitals. However, mental hygiene activities should go into the routine of kindergartens, public schools, industry, the public sphere of activities, and the homes of the families.

When a child is found, through various facilities such as clinics, schools, family physicians, pediatricians, various social agencies, church, juvenile and family courts and others interested in the welfare of the child, not responding to extra-mural treatment, he should be hospitalized in a psychiatric preventive center where a well organized team, composed of psychiatrist, pediatrician, psychologist, social worker, educator and others, will tackle the problem intelligently and understandingly.

While the child is under treatment in the center, plans for his future socialization in the community must be worked out by the staff. It would be a fallacy to allow an adjusted child to reenter into the sphere of an undesirable existence.

Iontophoresis in the Treatment of Peripheral Vascular Disease

H. S. Pemberton, M.B., F.R.C.P., and D. C. Watson, M.C., M.B., M.R.C.P. (From the Medical Unit, David Lewis Northern Hospital, Liverpool) In BRITISH MEDICAL JOURNAL, 4628:9:633, September 17, 1949.

Among the methods of treatment designed to overcome vasospasm or to produce vasodilatation in peripheral vascular disease the use of choline derivatives is suggested by the work of Dale and Gaddum (1930) and Dale, Feldberg, and Vogt (1936).

Numerous workers, particularly in America, have obtained good results in peripheral vascular lesions. Kramer (1937), using mecholyl iontophoresis in 30 cases of various types, observed beneficial results in 22. Murphy (1937) treated 33 cases of thrombophlebitis by the same means, and found substantial improvement in 31. Ready healing of associated varicose ulcers was seen. Saylor, Kovacs, et al. (1936) obtained satisfactory results in 23 out of 26 patients with varicose ulcers.

The present series, comprising 83 unselected cases, covers the period from 1938 to 1948. The cases are divided into three almost equal groups by the exigencies of the recent year. Having used mecholyl from 1938, we were deprived of it in 1941 and used doryl, moryl, and carbachol as substitutes. It was not until 1946 that acetyl-B-methylcholine again became available as amechol.

The standard adjuvant treatment given to these patients consisted of rest, warmth, and antiseptic measures where necessary; in cases of diabetes mellitus the blood-sugar level was kept within reasonable limits. The patients were usually in bed, though the majority of cases of intermittent claudication were treated as outpatients.

The treatment of 83 cases of peripheral vascular disease by iontophoresis is described. The greater value of acetyl-B-methylcholine for this purpose is shown.

Bulbar Poliomyelitis: Favorable Results in Its Treatment as a Problem in Respiratory Obstruction

Thomas C. Galloway, M.D., and Martin H. Seifert, M.D. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 141:1:1, September 3, 1949.

We believe that anoxia and carbon dioxide accumulation due to difficulty in swallowing, with secretional obstruction, are responsible for most severe central effects in bulbar poliomyelitis.

Treatment designed to clear the airway and relieve obstruction has been successful in 15 consecutive cases of bulbar poliomyelitis in this series.

Such results should not be exceptional in bulbar poliomyelitis.

A physician trained in the recognition and treatment of respiratory obstruction is an essential member of the poliomyelitis team.

Mechanical Respiration

Ursula Blackwell. In THE LANCET, No. 6568, p. 99, July 16, 1949.

The merits and disadvantages of various types of respirator are compared, and it is concluded that the Stille is the best machine so far obtainable in this country.

The indications for the use of breathing-machines are given, and the management of the patient is described for the Drinker, Both, and cuirass.

Complications and their treatment are discussed.

Criteria for the permanent removal of a patient from the respirator are given; it is inadvisable to discontinue mechanical respirator too early.

Administration of a Medical Rehabilitation Service in a Neuropsychiatric Hospital

Daniel Dancik, M.D., Northport, New York. In ARCHIVES OF PHYSICAL MEDICINE, 30:10:657, October 1949.

It is essential that a medical rehabilitation service in a neuropsychiatric hospital be under the direct supervision of a physician who is well grounded in clinical psychiatry and, at the same time, interested in the social and physical aspects of medicine. In order properly to coordinate the activities of this service, the physician in charge of a medical rehabilitation service in a neuropsychiatric hospital requires the assistance of many persons, including the medical specialist, the surgeon, the ward psychiatrist, the psychologist and the social service worker, as well as such personnel of the medical rehabilitation service as occupational therapists, manual arts therapists, corrective therapists, educational therapists and physical therapists. He also needs the help of persons interested in such adjunct therapies as recreation, music, sports and library activities.

In order to permit the physician in charge of medical rehabilitation to interview the patients assigned to the medical rehabilitation service, a large central medical rehabilitation building should be available to house the facilities of manual arts therapy, occupational therapy, educational therapy and a large gymnasium for use as a corrective therapy clinic and proper office space should also be available in the same building. Such a building permits proper integration and central control of all activities of a medical rehabilitation service.

This article does not intend in any way to suggest that this therapeutic program is superior to any other or a substitute for any other but strongly recommends the installation of a medical rehabilitation department in all neuropsychiatric hospitals as an adjunctive service to the therapy of the neuropsychiatric patient. The emphasis is placed on the proper mode of socialization and the restoration of the neuropsychiatric patient to society or his adjustment to the milieu of the hospital. Medical rehabilitation in a neuropsychiatric hospital offers a therapeutic program to overcome a situation which has been aptly described by one writer as follows: "Nothing is more depressing than to visit a ward in a neuropsychiatric hospital and find physically able patients sitting about deteriorating with nothing to do day after day but sit and look at others doing the same thing." It is the goal of medical rehabilitation to keep the neuropsychiatric patient in motion and in continual contact with reality; to provide the activity which will assist all other therapeutic services of the hospital in restoring the neuropsychiatric patient to a social medium, and, if possible, to return him to community life in the best possible physical and mental condition, prepared to adjust successfully to social and vocational pursuits.

The Rehabilitation of the Amputee

George G. Deaver, M.D., and Earl H. Daniel, New York. In ARCHIVES OF PHYSICAL MEDICINE, 30:10:638, October 1949.

Care of the Stump.—It is the surgeon's responsibility to prescribe the physical therapy measures necessary to prepare the stump for the prosthesis and to instruct the patient on the care of the stump after he leaves the hospital.

The usual procedure of placing the stump on a pillow encourages flexion deformities.

Massage is not indicated as a routine treatment for amputation stumps, but in selected cases it may be useful in reducing edema, preventing adhesions or loosening scar tissue.

Heat in some form often is useful in improving the circulation of the stump, promoting wound healing and relieving pain. The whirlpool bath is a useful method of applying heat and massage to the stump. The contrast bath, by producing alternate vasodilatation and vasoconstriction, is more beneficial than a warm or cold bath. Long periods of immersion in warm water tend to soften the skin, which needs to be toughened rather than softened.

Pressure exercises are used to harden the stump in preparation for weight bearing and should be started the second week after the operation.

Shrinking the stump can be accomplished by using bandages or a canvas or leather shrinker.

Exercises for the Stump.—As prosthetic appliances cannot be worn for several months after the amputation, it is essential that a program of exercises be given the amputee to maintain joint movement, prevent contractures and strengthen the muscles of the stump. The types of exercises most useful in accomplishing these objectives are as follows: (1) active and passive exercises, used to maintain joint movements; (2) active resistive exercises, prescribed to increase muscle strength, and (3) passive stretching exercises, used to overcome contractures which usually occur if the postoperative care has not been adequate.

In prescribing active exercises for patients with lower extremity amputations, it is essential that all the movements of each of the remaining joints be included in the program. The movement which is most frequently forgotten is hyperextension of the thigh. It is impossible to walk correctly if this movement is lacking.

In patients with upper extremity amputations the seven movements of the shoulder joint and the four movements of the elbow joint must be maintained.

Shoulder contractures occur if the amputee is not instructed to move the stump. With the loss of the hand, the amputee has no reason to move the arm and carries it in an empty sleeve or in a sling. The result often is a limitation of motion at the shoulder joint.

Exercises for Amputation Stumps.—The exercise programs which have been recommended in recent years originated in Army and Navy Hospitals. In these amputation centers there were sufficient personnel and special equipment to carry on an intensive personalized program over a long period of time for young men with amputations resulting from trauma. Most of our civilian hospitals do not have the personnel, equipment or sufficient time to conduct this ideal program, which, in many instances, is not suitable for amputees in the upper age groups with diabetes, arteriosclerosis and cardiac disease. It would seem, therefore, that the civilian program of exercises must be easy to perform and not require extensive special equipment or the services of a physical therapist.

Apparatus Exercises.—One of the best single pieces of equipment for exercising the stump to obtain motion, increase strength and stretch contractures was devised by Mennell during World War I. It consists of a wooden table with two parallel slits 6 inches wide and 18 inches long cut out of the lower half of the table top. The patient's pelvis is fixed to the table by a strap; a harness is placed over the end of the stump and passed through the slots in the table, and weights are attached to the ends of the harness. The flexor muscles of the hip joint are strengthened by raising the weights. Hip flexor contractures are stretched by increasing the weights on the harness and flexing the thigh of the unaffected extremity.

Assistive Exercises.—The assistive exercises help the patient in making a movement and are useful in stretching contractures. It is important to remember that contracted muscles often are stronger than the decalcified bones of the aged, and fractures have been known to occur as a result of too vigorous assistive and resistive exercises.

Single Action Exercises.—The best results are most often obtained from the exercises performed by the amputee without the benefit of special apparatus or the assistance of others. They should be performed several times a day.

Gravity Exercise.—One of the best methods of stretching contractures is to place the body in a position so as to utilize the force of gravity or the weight of the body.

CRUTCH WALKING FOR AMPUTEES

The amputee cannot be expected to use crutches unless he is fitted with the proper crutches and accessories, has sufficient strength in the muscle groups necessary for crutch walking and receives instruction in how to stand, balance and walk.

Muscular Demands of Crutch Walking.—The five muscle groups needed particularly for manipulation of crutches are, in order of importance: (1) Flexors of the arms. (2) Extensors of the forearms. (3) Fingers and thumb flexors. (4) Dorsiflexors of the wrists. (5) Shoulder girdle depressors and downward rotators.

The demands of crutch walking are heavy, and one cannot give a patient a pair of crutches and expect him to walk. Crutch walking requires instruction in the fundamentals before the first attempts at performance.

Standing with Crutches.—When the patient has sufficient strength in his unaffected leg and arms, he must get the feel of crutches under his arms in a standing position. He is placed against the bed or wall in a standing position with his crutches under his arms.

The correct crutch stance is a position in which the head is up straight and tall and the pelvis is held as much as possible over the feet.

Crutch Gaits.—There are nine standard crutch gaits, but only four of these, the tripod crutch gaits, can be used with only one extremity. The patient must first learn the tripod alternate crutch gait.

Crutch-foot sequences:
(1) move right crutch forward 3 inches.
(2) move left crutch forward 3 inches.
(3) draw the body forward 3 inches.

When the patient has learned to propel the body forward by the tripod alternate gait, he is then taught the tripod simultaneous crutch gait.

Crutch-foot sequences:
(1) move both crutches forward 3 inches.
(2) drag the body forward.

The tripod simultaneous gait differs from the tripod alternate gait in that the two crutches are placed on the floor at once. The body is jerked, dragged or slid along the floor, and the crutches are lifted once more. It is a sort of rocking backward and forward between crutches and feet. The tripod gaits are slow, labored gaits which precede the swinging gaits.

The patient is now taught the swinging-to crutch gait which consists of placing the two crutches simultaneously in front of the body, bearing down on the crutches and lifting the body so that it moves up to the crutches and immediately lifting both crutches and placing them on the floor ahead.

Crutch-foot sequences:
(1) both crutches move forward.
(2) lift and swing body to crutches.

The crutch gait best adapted for the amputee is the swinging-through crutch gait. It is a difficult gait because the subject must lift both crutches by rocking backward, straighten his arms, raise his body and swing it forward through his crutches. Our experience indicates that if a person with a midthigh amputation cannot learn this crutch gait, he cannot learn to use an artificial leg. If, however, the amputee follows the procedures outlined and acquires the strength, flexibility, balance and control of the crutches and is taught the tripod crutch gaits and swinging-to crutch gait, he should be able to learn the swinging-through crutch gait.

Crutch-foot sequences:
(1) both crutches move forward.
(2) lift and swing body beyond the crutches.

When the patient is able to perform this gait the following sequence will be observed:

1. He raises the crutches and replaces them forward.
2. He pushes down on crutches, straightens the elbows and raises the body weight off the floor and swings the leg between the crutches.
3. The crutches move forward with body swing and the heel strikes the floor in front of the crutches. The body and leg are in front of the crutches.
4. He rolls the pelvis forward and the momentum brings the trunk and crutches to the erect position. Keeping the hips forward with the back arched is essential for a smooth and graceful swinging-through gait.

Prosthetic Appliances for Children.—The problems which arise in relation to prosthetic appliances for children are the results of the parents' desire to hide the deformity.

It is generally agreed that artificial legs for children should be obtained just as soon as possible. There is no unanimity of opinion as to when prosthetic appliances should be made for children with arm amputations.

TRAINING IN THE USE OF ARTIFICIAL LIMBS

Artificial Arms.—The methods used in teaching the arm amputee how to use his appliance are entirely different from those used in training the leg amputee. If the socket fits comfortably, the harness sits snugly in the correct position on the body, the armpit loops which operate the control cords are padded properly with some soft material to avoid skin abrasions and the arm hangs properly, the primary successful steps have been accomplished.

In order to operate an artificial arm properly it is necessary to maintain the normal range of motion at the joint and increase the strength of the muscles. The artificial arm will seem heavy and cumbersome and difficult to operate, but with practice and patience the operation of the hand and hook will become as automatic as opening and closing the natural hand. Some companies have developed as many as sixty special devices to be used in conjunction with the artificial arm.

Arm amputees can usually be fitted with an appliance from two to three months after the amputation. During this period of waiting it is necessary that the amputee be given exercises to maintain the range of motion at the joints and increase the strength of the muscles.

Artificial Legs.—The ability to walk on an artificial leg depends upon the amputee's age, skill in balancing, strength, daring, site of the amputation and length of the stump. It is, therefore, impossible to expect all amputees to walk in a similar manner.

No amputee can be expected to walk properly if the prosthesis is not properly made and fitted. The most frequent cause of difficulty is a poorly fitted socket.

Balance is the most important factor in the primary stage of learning to use artificial limbs. Walking has been described as losing balance and regaining balance. Before walking is attempted, it is necessary for the amputee to learn to balance so that he can shift his weight from one limb to the other. This is essential for the unilateral as well as for the bilateral amputee.

Balancing can best be taught by having the amputee standing in parallel bars facing a mirror and performing the following exercises:

Position: Grasp the parallel bars; stand erect with shoulders back and the weight distributed equally on both legs.

Exercise: Lean to the left. Lean to the right. Return to position.

In performing these movements it will be found that the amputee has been grasping the bars with all his strength.

The next procedures are to have him perform the movements with

1. Less tension in the hand grips.
2. Touching the bars with his fingers.
3. Using only the left hand to touch the left bar.
4. Using only the right hand to touch the right bar.
5. No hands touching the bars.

The next procedure in teaching the patient is to have him raise the legs.

Position: Grasp the parallel bars; stand erect with shoulders back and the weight distributed equally on both legs.

Walking Exercises.—After the amputee is able to balance and raise and lower his legs in the stationary position, short steps should be tried.

As the subject performs the movements of the arms and hands as he walks forward in the parallel bars the following points must be noted:

1. Be sure that at every step the foot is placed the same distance ahead of the other foot so that there will be no limp from uneven steps.

2. One of the most frequent mistakes made in training the above the knee amputee is allowing him to take a rather long step, and before the weight is transferred on the artificial limb, the foot goes to the extreme end of the step and then drops back 4 to 6 inches before it is placed on the floor. In some cases this may be caused by a very free action knee and may have to be controlled by a friction knee joint. The friction knee will prevent the foot from dropping back too quickly. The heel must be placed on the floor when the foot reaches the end of the forward movement.

3. The steps must be very short in the beginning. When the amputee acquires the coordination and ryhthm of walking and learns how to change his weight from the normal to the artificial leg, he can gradually increase the length of his stride.

4. At no time should the amputee be allowed to use crutches in learning to balance on the limbs or in taking steps. The amputee should remain in the parallel bars until he acquires the proper pattern of walking.

5. Do not allow the amputee to walk until fatigued. Have him sit down and arise from a chair at frequent intervals. This will help in acquiring balance and confidence. Five minutes is considered sufficient for the first work period, followed by ten minute rest periods. The walking periods should be gradually increased and the rest periods decreased.

6. In bilateral above knee amputations the same procedures are followed, except it has been found best to keep one knee locked in starting the training.

It must be remembered that to the bilateral above the knee amputee on artificial legs it is similar to being on a pair of stilts with knee joints. By keeping this in mind it will give some idea of the difficulties the bilateral amputee must overcome in learning to walk. Very few men learn to use full length legs, as they are top heavy on their first trial and get discouraged. It has been found best to start the bilateral above knee amputee on "stubbies." These are short legs with restricted knee movements and very short shins and thighs. As the amputee learns to use these short legs they can be gradually increased in height.

7. In below knee amputations the same procedures are followed in acquiring balance. The principal factor to emphasize is bending the knees at each step.

Walking with Canes.—When the amputee has learned to walk correctly in the parallel bars he should be given a pair of canes. The method of walking is the same except that he grasps the canes instead of the bars.

Elevation Activities.—Amputees with a unilateral above knee amputation can ascend the stairs on their artificial limb by raising the normal leg first. In descending stairs it is best to place the instep of the artificial leg even with the front edge of the step. The leg will then roll over and bend at the knee when he places the normal leg on the step below.

Bilateral below knee amputees usually require a hand rail to ascend and descend stairs, while bilateral above knee amputees always require a hand rail.

CONCLUSION

How successfully the amputee can learn to walk and perform the activities necessary for daily living and working depends on a properly fitted prosthesis and careful instruction in its use, the age and skill of the amputee, the length of the stump and nature of the amputation, whether unilateral or bilateral.

Progress with a New Plan for Polio Care

In HOSPITALS, 23:9:39, September 1949.

A national conference sets down its recommendations for comprehensive hospital care. This report is designed to answer many of the urgent questions about polio and how it best may be treated.

The seriousness of the poliomyelitis epidemic, now reaching the expected season's peak, is mitigated partly this year by these factors: more hospitals accept polio cases; more early and mild cases are being reported; better trained physicians, nurses, physical therapists and other professional workers are available and as a result, more persons are being discharged from hospitals completely recovered.

Improved practices for the control of poliomyelitis are being followed by health officers, hospitals, physicians and others. These account for much of the new optimism. Recommendations for the improved practices were formulated by a national conference sponsored by the National Foundation for Infantile Paralysis last June and they are endorsed by the executive committee of the Association of State and Territorial Health Officers.

In studying the major problems relating to the control of poliomyelitis, the conference members found four that are especially serious and from them formulated the new recommendations. The four problems are:

1. Confusion resulting from great variation in state and local practices for the control of poliomyelitis, especially those concerning isolation and quarantine.

2. Desirability of standardization based on known scientific and epidemiological facts to promote uniform control measures.

3. Need for a national body of qualified opinion to guide and support state and local health authorities in effecting desirable modifications or changes in sanitary codes and practices for control.

4. Many existing regulations require practices which not only are ineffective in the control of poliomyelitis and unwarranted by facts but also which create problems for patients and families, health officers, physicians and hospitals. A special hospital problem, for example, centers on requirements for unnecessarily long periods of isolation. Such practice creates a bottleneck by limiting capacity when the patient could be discharged earlier to home or convalescent centers. This creates barriers to most effective treatment particularly needed in the early stage of the disease, is unfair and harmful to the patient and family and increases operational and personnel costs to the hospital, patient and agencies paying for care.

Enforcement of unwarranted quarantine regulations may create fear and hysteria, waste the time and efforts of professional personnel and facilities and produce needless economic and social hardships for the patient and family.

Localizing Cerebellar Syndromes

Joe R. Brown, M.D., Minneapolis. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 141:8:518, October 22, 1949.

Based on present concepts of cerebellar anatomy, there are five recognizable pure cerebellar syndromes. These have been described as the posterior lobe, vestibular complex, anterior lobe, generalized deficit and bilateral posterior lobe syndromes. In addition, there are three variant localizing syndromes which result from associated implication of cranial nerves and brain stem structures. Illustrative cases are cited, prognosis is indicated, and the results of therapy are suggested.

The Care of Hand Injuries: Part III—Surface Injuries

Prepared by the American Society for Surgery of the Hand. In THE NEBRASKA STATE MEDICAL JOURNAL, 34:9:332, September 1949.

As soon as epithelization of burned surfaces is complete, directed active use and exercise of the hand is begun. Normal use of the hand is encouraged and voluntary exercise and appropriate occupational therapy prescribed.

Specialization in Medicine: What is Orthopedic Surgery?

Ralph K. Ghormley, M.D., Rochester, Minn. In JOURNAL OF BONE AND JOINT SURGERY, 31-A:3:459, July 1949.

The borders of most specialties are not clearly defined, and orthopedic surgery is no exception to this. Constant changes in the scope of a specialty will be noted, just as the individuals in that specialty increase their knowledge and skill in the care of certain conditions which may be called borderline. As medical knowledge advances by the development of scientific facts, specialties will ultimately tend to become more stabilized.

Let me emphasize my belief that, while specialties develop and specialists become more expert in their chosen fields, the need for cooperative effort by specialists in treating many individuals becomes more evident. Nothing is more pitiful than the sight of a highly specialized individual facing some problem entirely outside the limits of his specialty, without the aid of someone versed in the care of this particular condition.

Borderline specialties will assume certain phases of the care of patients which have heretofore been regarded as the work of orthopedic surgeons. Such work as physical therapy is being taken over by specialists in physical medicine, and will be taken over to an increasing extent. In some areas the supervision of brace-making is being assumed by those other than orthopedic surgeons; and it is my belief that many practicing our specialty could profit by a better understanding of the importance and the methods of brace-making. Rehabilitation, which was started by orthopedic surgeons in World War I, may become another specialty.

As the interests of orthopedic surgeons have tended to center more on operative procedures, some of the less spectacular but equally important phases of our specialty may have been forgotten.

Tendon Grafts in the Hand

Carruth J. Wagner, M.D., F.A.C.S. In THE MILITARY SURGEON, 105:3:196, September 1949.

Postoperative care is very simple. The original dressing is not disturbed for a full 3 weeks, and during this time the arm is elevated to prevent edema and hematoma formation. At the end of this time the dressing is removed and all sutures, including the pull-out wire, are removed. A simple plaster splint is then applied to prevent extension of the finger and to allow flexion, and the wrist is released. Active flexion exercises are then instituted and after a week all immobilization is discarded and the exercise intensified. An exercise board is introduced and active splinting utilized if any joint stiffness has occurred during immobilization.

Tendon grafts in the treatment of unrepaired lacerated flexor tendons in the hand will yield uniformly good results if principles of the indications, functional results to be expected, and surgical technic as advised by Bunnell are strictly followed. In a small series of cases treated at this hospital since instituting these principles, the results have been gratifying, and there have been no complications.

Physical Medicine in Peripheral Vascular Diseases

William Bierman, M.D., New York. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 141:5:318, October 1, 1949.

All measures to relieve the subject with peripheral vascular diseases are intended to restore the normal balance between metabolic needs and supply of the tissues. These efforts are made to augment the blood supply by vasodilation and by increasing the collateral circulation except in extreme instances. Such an extreme instance occurs when there is no possibility of influencing blood flow, as in thrombosis of the common iliac arteries. Here the reduction of the metabolism of the structures of the lower extremity can be accomplished by the local application of cold. This measure will cause a diminution of the severe pain of these patients.

A simple measure to increase circulation, when this is possible, is the use of heat. Heat also causes an increase in the metabolic needs of the tissues to which it is applied. For these reasons, when heat is applied directly to involved extremities it is administered in small doses. When heat is so applied by means of hot water bags, lamps and high frequency currents there is danger of causing thermal damage to tissues in which there is interference with the blood supply. An increase in pain, or the development of an increase in cyanosis, calls for the cessation of the treatment or a reduction in the quantity of energy used. The difficulty may be due to an increase in local tissue pressures, to increased local metabolism without compensating vascular supply or to direct tissue death, inasmuch as poor circulation cannot remove heat as rapidly as normal circulation. The danger of causing thermal damage is further enhanced if thermal sensation is lost in the treated part. A good instrument for mild and prolonged local heating is the thermostatically controlled foot cradle, the air temperature of which is usually maintained between 88 and 95 F. When more vigorous methods of heating are employed, as with large lamps and diathermy machines, it is safest to apply the heat to some remote part of the body, such as the arms or the torso. Electrically heated sheets and blankets now permit a simple technic for the application of mild and prolonged heat to the entire body.

As with heat, exercise can increase both the circulation and the metabolic needs. In cases in which the local circulation is greatly compromised, as indicated by a discoloration of sudden onset or one that rapidly increases, by the presence of gangrene or ulceration or by severe pain during rest, exercise is contraindicated. According to Wright, the extremities should be held about 3 to 6 inches (0.64 to 1.27 cm.) below the position of the heart, because this is the plane at which to obtain the best blood supply as shown by the filling of the superficial veins—indicated by their slight projection above the skin level.

In the absence of gangrene or extensive ulceration, the patient should be encouraged to walk until pain develops. After a rest, he can resume walking. If the involvement is severe, the Buerger type of exercise can be applied while the patient lies in bed. With the patient lying in the supine position, the extremity is elevated 60 to 90 degrees above the horizontal for the minimum time required to produce ischemia (thirty seconds to three minutes). It is then allowed to hang down over the end of the bed until one minute after the appearance of the reactionary rubor (two to five minutes). The leg is then held in the horizontal position for three to five minutes. This cycle is repeated for one-half hour to one hour three or four times a day.

Sanders devised an apparatus which automatically and continuously rocks the bed through an arc of 60 degrees at a slow, regular rate. Patients soon learn to lie and sleep on this device without experiencing any discomfort. It is particularly valuable for those patients in whom the effort required for the performance of the Buerger exercises is too great. In many patients it relieves pain. It is said to retard the decalcification which occurs during prolonged periods of rest in bed. It may be used either continuously or for intermittent periods during the day, by itself or in conjunction with other measures.

Histamine and acetyl-beta-methylcholine chloride applied by iontophoresis will cause cutaneous vasodilatation and can therefore be employed for the treatment of peripheral vascular diseases. Both these drugs are useful for the care of indolent ulcers. Asbestos paper or gauze soaked with histamine acid phosphate (1:1,000) or acetyl-beta-methylcholine chloride (0.1 to 0.5 per cent) is placed on the region to be treated and is connected by suitable electrodes to the positive pole of a unidirectional source of current. The negative pole is connected to a large dispersive pad placed on the back, or elsewhere on the body. Ointments may be used instead of solutions. Details of technic must be followed carefully in order to avoid burns, which can be exceedingly resistant to healing.

Carbon dioxide baths will also cause vasodilatation. It is claimed that carbon dioxide and oxygen are absorbed by the skin. Benatt has stated that carbon-dioxide-containing baths lead to hyperemia and an increase of the velocity of blood flow of the subcapillary venous plexuses.

Mechanical apparatus designed to produce an increase in peripheral circulation, such as that for alternating negative and positive pressures and for intermittent occlusion, are now but little used.

Clinically, the whirlpool bath has shown itself to be of value, even though objective evidence of increased circulation has not been observed following its application. We have observed the healing of persistent, indolent ulcers occurring on a thrombophlebitic or arteriosclerotic basis (with or without diabetes) following the use of the whirlpool bath medicated with sulfathiazole and with oxygen. The apparatus required for the production of this bath can be simple and relatively inexpensive.

Physical measures play an important part both in the diagnosis and in the treatment of peripheral vascular diseases. In a large percentage of cases relatively simple procedures, such as those commonly employed in clinical inspection and palpation, prove adequate for diagnosis and uncomplicated devices, such as hot water baths, heating pads, electric blankets, lamps, whirlpool baths, exercise and hygienic measures, are adequate for treatment purposes. Some persons who have peripheral vascular disease require the special disciplines which have been developed for the diagnosis and treatment of this condition. These measures may be of service for the prophylactic care and for the comfort of the elderly person and for the subject who shows subclinical signs of inadequate peripheral circulation.

Rehabilitation of the Arm Amputee

Henry H. Kessler, M.D., F.A.C.S. In NEW YORK STATE JOURNAL OF MEDICINE, 49:16:1921, August 15, 1949.

In the rehabilitation of the arm amputee a five-point program is required: the psychologic preparation of the patient, the selection of adequate surgical methods which will give him a painless and satisfactory stump, the aftercare of stump, the selection of a device or special surgical procedure which will permit him to wear a

prosthesis, and, finally, the training of the amputee in the use of the prosthesis. By this means the military and civilian amputees can take their place in commercial and industrial life in competition with those who are not physically handicapped. Fortified with the special skills acquired by proper training, they can face the future with possibilities unlimited.

Educational Problems in Physical Medicine and Rehabilitation

Earl C. Elkins, M.D., Rochester, Minnesota. In ARCHIVES OF PHYSICAL MEDICINE, 30:10:623, October 1949.

Physical medicine and rehabilitation, in its development, perhaps can be compared to surgery and its development. In medieval times, and even somewhat later, the barber-surgeon justified the second element of his designation by performing those lowly duties looked down upon by the physician as merely the technical pursuit of a craftsman. However, what was once regarded as the work of a technician became an intricate professional specialty, held in high esteem by nearly everyone, not least perhaps by its own. The development of physical medicine was similar, to the extent that standards for the technical personnel were developed before the medical specialty emerged. That our specialty developed thus is the fault of no one. Scientific knowledge relative to the field, interest in it, and educational facilities, all were lacking. The technical groups, being obliged to develop and apply specific procedures, increased their knowledge more rapidly than did the physicians with whom they were associated. However, because the educational background of the technicians was limited, they could not, and did not expect to, develop the field of physical medicine and rehabilitation to the greatest possible extent.

Physiatrists, few that there are, can recognize the tremendous strides made in the field of physical medicine and rehabilitation. However they, I should say we, are meeting, and are going to meet, just as great obstacles to further progress as have been met in the past. Therefore, possibly we must revamp educational methods and attitudes so that all physicians, as well as specialists and technicians in the field, will be increasingly better equipped as the years go by. The formal education of the physician begins in the premedical years.

The Premedical and the Medical Student.—Probably it is impossible, with present limited facilities and personnel, to teach physical medicine and rehabilitation adequately at the undergraduate level. This is unfortunate because the interest of the medical student is plastic. He is attempting to formulate his plan for the future and he would be receptive to instruction which would reveal to him the potentialities of physical medicine in diagnosis and treatment.

The Intern and the Resident.—Just as teaching of physical medicine and rehabilitation in the medical school has been inadequate, so has the teaching in hospital displayed some imperfections. There has been some tendency to deal in generalities. This lack of specificity fails to inform the young physician and, consequently, it fails to interest him.

The Specialist.—And now, assuming that the specialty has been made attractive to a promising resident, of what shall his further training consist and what manner of man must he become? The training of one who wishes to become a specialist in physical medicine and rehabilitation must include: (1) instruction in the basic sciences as they apply to physical medicine; (2) actual practice of all diagnostic and therapeutic methods and procedures used in physical medicine; (3) opportunity for widely varied and carefully supervised clinical practice; (4) facilities for basic and clinical research; (5) attendance at carefully prepared and carefully supervised seminars; (6) some training and observation in allied fields such as orthopedics, neuropsychiatry and general medicine, and (7) some orientation in relation to the functions of the psychologist, the social worker, the vocational educator, the physical therapist and the occupational therapist.

It may become necessary to change our concept of training of the ancillary personnel who do so much of the essential work in physical medicine and rehabilitation. The approved standards already established should remain as they are. It may be well to change the emphasis, however.

Perhaps the preponderance of emphasis should be placed on the basic factors involved in use of procedures and on the technics of treatment relative to restoration of function. If the ancillary personnel succeed in absorbing all technical knowledge which they must have in order to follow adequately all the possible specific orders for treatment, they will have accomplished all that is possible in the period allotted to training.

Considering that the content of training remains somewhat in doubt, it is not astonishing that there is some controversy as to how medical supervision of training of persons whose services are ancillary to physical medicine and rehabilitation is to be provided. Schools of physical therapy have medical directors, who may be specialists in other fields than physical medicine. Probably much misunderstanding could be avoided if more physiatrists were available to be actual directors of the technical schools. Certainly a physiatrist should have an active, important and directive part in the training of physical therapists. This does not mean that the physiatrist wishes to have to do with the academic prerequisite education of candidates for admission to training for qualification in the technical fields of physical medicine and rehabilitation, except possibly in an advisory capacity. Nor does it mean that, in the technical schools, the physiatrist will do all of the teaching himself. However, as a physician and a specialist, he should be more capable of organizing, supervising and correlating the training of ancillary groups than any other medical specialist or nonmedically trained person. As conditions are now, direction of many schools of physical therapy is essentially in the hands of the technical director.

Problems in education will always be with us. To help find the solution of educational problems in physical medicine and rehabilitation is the responsibility not only of the physiatrist but of all who are interested in the field, whether they be medical specialists, general practitioners or technical associates. On our own members, however, in the American Congress of Physical Medicine, descends the majority of the burden and willingly, gladly, we assume it.

Modified Protamine Insulin (NPH-50): A Clinical Report

Priscilla White, M.D., Boston. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 141:5:312, October 1, 1949.

Regulation of diet and exercises is a necessary adjunct to treatment with modified protamine insulin in order to maintain chemical control. With the patient under medical observation it was seldom necessary to add, or supplement with, rapidly acting insulin.

Modified protamine insulin combines long duration of action with rapid availability. When administered before breakfast, its hypoglycemic hazard is nocturnal.

Infantile Paralysis—The Research Story

Harry M. Weaver. In HYGEIA, 27:9:608, September 1949.

By 1938 several important facts about poliomyelitis had been established:

On the basis of these facts the National Foundation for Infantile Paralysis announced four research objectives:

1. Find some means to eliminate the virus or prevent its coming in contact with man.
2. Develop methods to make man resist the virus.
3. Devise some means to arrest the disease in human beings before it has induced crippling or death.
4. Discover better methods of treatment to minimize even more the crippling after-effects of the disease.

Treatment Steadily Improves

Since 1938 we have developed a far greater understanding of the true nature of the disease. Paralleling this acquisition of knowledge has been a progressive improvement in the treatment. While it is true that paralysis and death cannot entirely be prevented, many lives have been saved and the disabilities resulting from paralysis have been materially lessened.

It is almost impossible to determine the precise extent to which new methods of treatment for poliomyelitis have saved lives and lessened disabilities. It is very difficult to determine the actual worth of a method of treatment for any disease in which there is normally a high rate of recovery. From what we know today it appears likely that the majority of infantile paralysis patients would completely recover even though treatment were limited to bed rest, good nursing care and adequate food and water.

One must be skeptical of dramatic reports of "cures" or radically new treatment for this disease. Poliomyelitis is a fertile field for overenthusiasm and even for quackery. Persons responsible for circulating false hopes should think in advance of the heartaches that premature announcements of "cures" cause the parents of children who have fallen victims to this disease.

How It Can Be Done

Medical research employs the same kinds of abilities, intellects and methods that have produced the industrial revolution. There are, however, two important differences between medical and industrial research. Most research in industry deals with inanimate substances; medical research deals with life, and especially human life.

The National Foundation for Infantile Paralysis has made possible a program of research wherein all ideas of merit relating to poliomyelitis can be exploited to the fullest extent. That is the only road to the knowledge that will one day vanquish this crippler of little children.

Metatarsus Adductovarus—"Skewfoot"

Donald W. McCormick, M.D., Fond du Lac, Wis., and Walter P. Blount, M.D., Milwaukee. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 141:7:449, October 15, 1949.

Metatarsus adductovarus, or skewfoot, is a clinical entity which is now more prevalent in this country than clubfoot.

Untreated skewfoot may persist as an annoying deformity with hallux valgus, bunion, flatfoot and chronic foot strain.

Adequate early and persistent manipulative treatment with casts will completely correct the moderate deformity.

Follow-up by clinical and roentgen examination is important.

Severe or untreated skewfoot in the older child requires operative treatment for adequate correction.

Tibial Torsion

Charles G. Hutter, Jr., M.D., and Walter Scott, M.D., Los Angeles, California. In THE JOURNAL OF BONE AND JOINT SURGERY, 31-A:3:511, July 1949.

The normal adult tibia exhibits about 20 degrees of external torsion.

Extremes of tibial torsion, internal or external, if permitted to persist, produce handicapped members of our adult society.

Infants and preschool-age children have less external rotation than adults.

Normal developmental changes do not correct extremes of torsion to any great extent, especially in school-age children.

Positions and other attitudes of posture will produce rotational changes in the tibiae, depending upon the direction of the rotary stress applied.

Correction of these deformities is possible in the growth period by the application of a simple night splint, which produces a rotational stress in a direction opposite to that of the deformity.

Deformities which are present at three years of age or older should be corrected at that age; younger children with torsional deformity should be observed in order to determine what compensatory changes may occur.

Need for Hospitals to Tie in with Rehabilitation Services in Their Work with the Physically Handicapped

Eugene J. Taylor, New York City, N. Y. In THE OHIO STATE MEDICAL JOURNAL, 45:10:983, October 1949.

The modern concept of this third phase of medicine, which takes the patient from the bed to the job, springs both directly and indirectly from the war. The rehabilitation programs of the military services and the Veterans Administration demonstrated that planned, integrated programs of convalescent care stressing activity as an adjunct to definitive treatment could reduce the period of hospitalization, offset the deconditioning phenomena of bed rest, and prevent the harmful psychological sequelae which often result from extended hospitalization. The technics of physical rehabilitation and retraining for the severely handicapped developed by the military services also have profound implications for the even larger number of our civilian population who are disabled.

Rehabilitation in the General Hospital

Although it would seem logical that medical rehabilitation would be an important service in every civilian hospital, there has been little or no attempt, until recently, to establish such programs in civilian hospitals. Of the 1,468,714 hospital beds in the United States in 1946, 44 per cent were in general hospitals, but these 641,331 beds cared for over 92 per cent of all patients.

A Medical Responsibility

Few communities in the United States envision or have the need of a community rehabilitation center the size of the new Institute of Rehabilitation and Physical Medicine at New York University or of a general hospital rehabilitation program as large as that of Bellevue Hospital. Their philosophy and administrative pattern, however, can be adapted to even the smallest community.

This motivation, to be most effective, must begin at the earliest possible moment following the accident or crippling illness. The physician who knows something of rehabilitation can start at the time of the accident or onset of the disease to allay the fears of the patient by giving understanding, courage, and hope predicated on an accurate knowledge of what can be done.

Reflex Vasodilatation by Body Heating in Diagnosis of Peripheral Vascular Disorders: A Criticism of Methods

R. H. Goetz, M.D., Ch.B., and F. Ames, M.B., Ch.B., Capetown, Union of South Africa. In ARCHIVES OF INTERNAL MEDICINE, 84:3:396, September 1949.

Immersion of one upper extremity or of both feet in water of 45 C. for thirty minutes, with prevention of the dissipation of heat from the body, normally results in reflex dilation in the other extremities.

The reflex vasodilatation is obtained in the upper extremities by immersion of the feet in the case of patients with high transverse spinal lesions (involving the sixth thoracic segment).

Vasodilatation is not obtained when the circulation through the immersed extremity is interrupted. Therefore, reflex vasodilatation is dependent on the return of heated blood, which acts on the thermosensitive center in the hypothalamus, and the mechanism of reflex vasodilatation from body heating is not nervous in origin.

The pressure required for occlusion of the arterial circulation of the lower limbs by means of a cuff fixed on the thigh is considerably higher than that required for occlusion of the circulation to the hand with a cuff above the elbow. It is therefore confirmed that the "blood pressure" in the lower limbs is higher than in the upper.

The method of measuring the blood pressure objectively and, if necessary, in two limbs simultaneously, with the digital plethysmograph, is described.

The higher "blood pressure" in the lower limbs is due to the larger volume of surrounding muscle. When the cuff is fixed above the ankle, the pressure required for occlusion of the blood flow is considerably lower than that required when the cuff is fixed at the thigh.

Heating of an occluded limb produces a considerable rise in blood pressure, owing to the accumulation of metabolites in the muscle. Because of this, and because of the high "blood pressure" in the lower limbs, an extremely high occlusion pressure is required to keep the circulation in the lower limbs interrupted during the period of immersion.

Failure to keep the circulation through the lower limbs occluded is considered the main reason why some authors obtained reflex vasodilatation on immersion of a limb in which the circulation was thought to be occluded.

Recognition of the "humoral" mechanism underlying reflex vasodilatation as obtained by body heating is of clinical importance. The blood flow through the immersed limb must be good; otherwise, an insufficient amount of heated blood is returned and reflex vasodilatation is minimal or absent. The method, therefore, gives misleading results when there is organic arterial disease of appreciable degree in the immersed limb. The results in such a case reflect the circulation in the immersed extremity, rather than in the one studied.

The findings in a case of severed axillary artery are described to illustrate the importance of good circulation in the immersed extremity for satisfactory assessment, by the immersion method, of the condition of the arterial tree in other limbs.

The Diagnosis and Treatment of "Mechanical Backache"

George S. Phalen, M.D., Cleveland. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 141:7:445, October 15, 1949.

Before making the diagnosis of "mechanical backache" the physician must evaluate carefully the patient's history, the results of physical examination and roentgenograms of the lumbosacral spine. No one of these three items must ever be omitted. The diagnosis of "mechanical backache" indicates that there is no actual disease or permanent structural abnormality which is responsible for the backache.

When the physician has made the diagnosis of a "mechanical backache," he may assure his patient that the condition is not a serious one and that it may be alleviated by certain simple measures. He should recommend that the patient sleep on a firm bed. A piece of plywood between the mattress and the springs is advisable, and a stiff cotton or hair mattress is better than an innerspring mattress. This firm bed prevents further strain on the back musculature.

Heat aids in the relaxation of the back muscles and stimulates circulation. The patient is advised to take a hot tub bath nightly, remaining in the water for a period of five to ten minutes. This should be followed by a twenty to thirty minute period of application of local heat, an infra-red lamp or a heating pad being used. It is not advisable to sleep on the heating pad all night. A few minutes of gentle massage over the back muscles may then be given by some other member of the patient's family, but this massage is not an essential part of the treatment. The patient then performs the series of exercises which have been prescribed by the physician and in which he or she has been carefully instructed. It is not enough to advise a patient to take exercises. The patient must be shown exactly how to perform the exercises, and the description of the exercises should be written down and given to the patient for ready reference. The patient is told not to attempt to do too many exercises at first because of the danger of overtaxing the already weakened back musculature. If possible, the exercises should be done both morning and night. It is imperative to do the exercises at least once every day.

The following list of simple postural exercises will be found adequate for most cases of "mechanical backache." If possible, each exercise should be performed five times at the onset and gradually increased over a period of several weeks or months to ten or fifteen times, depending on the individual patient's tolerance of exercise.

A. Lie on back with knees bent:
   1. Tilt the pelvis, flattening the lower part of the back against the floor.
   2. With pelvis tilted, raise the head and shoulders from the floor.
   3. With pelvis tilted, raise legs alternately.
   4. With pelvis tilted, straighten out one leg and then the other.

B. Stand with heels 4 to 6 inches (10 to 15 cm.) from the wall and with back against the wall:
   1. Tilt the pelvis, flattening the lower part of the back against the wall.
   2. With back flat, leave the wall; come up and down on toes; return to wall.
   3. With back flat against the wall, raise legs alternately.
   4. With back flat, walk away from the wall.

If more vigorous exercises are indicated to strengthen the back and abdominal muscles, the following may be prescribed:

1. Lie on back, elevate both legs with knees completely extended.
2. Lie on back with arms overhead, rise to sitting position and touch toes.
3. Lie on abdomen with arms at side, raise head and shoulders, arching back.

Back muscles are strengthened only by exercise and not by the wearing of a support. The wearing of a brace

for a long period of time delays the permanent cure, although the immediate effect may be beneficial.

The most common type of low back pain is the "mechanical backache," caused by some alteration in the normal body balance. This balance may be upset by certain mechanical factors such as faulty posture, obesity, relaxed abdominal musculature, weak back musculature and inequality of length of the lower extremities. Because a "mechanical backache" is seldom incapacitating, the physician is apt to minimize its importance, and the patient consequently seeks treatment from someone outside the medical profession. If the general practitioner will diagnose this condition, he can institute a program of treatment that will effect a cure.

Physical Medicine in the Treatment of Varicose Veins and Indolent Varicose Ulcers

Myer Fisher, M.B., B.Ch., Physician-in-charge, Palmer's Green Clinic, London. In THE BRITISH JOURNAL OF PHYSICAL MEDICINE, 12:3:58, May-June 1949.

On looking back over many years at the time wasted in the usual treatment of varicose ulcers by hot dressings and various plasters, one cannot help deploring the fact that many of these patients still attend at doctors' surgeries and hospital out-patient departments, without receiving treatment by ultraviolet light and the application of adhesive elastic plasters.

Treatment of ulcer.—In my own series of cases, the following technic was used: To all ulcers either hot saline or magnesium sulphate packs were applied for one week, and infra-red irradiation was applied at 18 inches distance for 15 minutes until the local swelling had subsided. The ulcer and the skin around it were irradiated with ultraviolet light by means of either the mercury vapor Alpine lamp or the Kromayer lamp, until a good erythema was produced. The rest of the leg was protected. A Cellanband, Flexoplast or Elastoplast bandage was then applied from above the toes, over the heel and up to the knee, for 1, 2 or 3 weeks, and the patient was told not to remove the plaster, no matter what was the odor, but just to apply some lint or cotton-wool over the area if the discharge soaked through. If the leg was too sensitive or became too irritable, then Ichthopaste bandage was used instead.

The use of ultraviolet irradiation undoubtedly results in a quicker response than does the use of the Elastoplast alone in clearing up the foul septic state so often met with in these conditions. This is in conformity with the physiological responses to the use of ultraviolet light. Pain, too, is relieved because of the reduced sensitivity of local nerve terminals. The skin becomes much more healthy, in consequence of increased leucocytosis and phagocytosism, and the odor disappears as a result of the bactericidal and hemobactericidal reactions.

Rehabilitation in Small Communities

Shelby Gamble, M.D. In THE OHIO STATE MEDICAL JOURNAL, 45:9:893, September 1949.

Rehabilitation, medically speaking, is a word that has great variance of meaning. Depending upon the degree of handicap present, it may range from a maximum of complete restoration to a minimum of enabling the individual to be partially independent so far as his daily needs are concerned. Even the attainment of self-sufficiency in toilet habits may help surprisingly in the economic problems of the patient's family, thus freeing another member of that family for gainful employment and eliminating or reducing the need for financial assistance with its resultant drain on family or community. Dr. Donald A Covalt of New York City has summed up competently the over-all picture in rehabilitation when he states, "The purpose is to teach the disabled patient to live within the limits of his disability, but to the hilt of his capability."

Physical Therapy

In small communities, this over-all plan should start at the local hospital, making use of a department of physical therapy. Although the department may be small and initially require only the part-time services of a physical therapist, a great deal could be done in preventing deformity, preserving and restoring muscle and joint motion, aiding in ambulation, and maintaining the best possible general condition of the patient.

Occupational Therapy

The next step in further development on a local hospital plan would be a department of occupational therapy. Occupational therapy may be used by itself or as a supplement to physical therapy, as it is a treatment based on activities. A definite program may be provided in which some mental or physical activity is scientifically supervised by trained occupational therapists for a specific purpose. Occupational therapy may be indicated for improving or maintaining morale; it may be entirely diversional, educational or recreational, or functional in the sense of restoring articular and muscular coordination, building up strength and physical endurance; it may be prevocational in the sense of being planned to reinstate the patient in his former job or to prepare him for new vocational training.

No one can outline a definite program that will fit all communities; this is an individual problem for each concerned.

Beta Ray Burns of Human Skin

Norman P. Knowlton Jr., M.D., Edgar Leifer, M.D., John R. Hogness, M.D., Louis H. Hempelmann, M.D., Loren F. Blaney, M.D., Dan C. Gill, M.D., William R. Oakes, M.D., and Charles L. Shafer, M.D., Los Alamos, N. Mex. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 141:4:239, September 24, 1949.

The development of the atomic energy program has resulted in a large increase in the number of persons exposed to radiologic hazards. With this increase it is essential that physicians and other scientists be acquainted with the dangers accompanying the handling of radioactive materials. Four cases of beta ray burns of the hands are reported here for the purpose of supplementing the present information in the existing literature, and emphasizing the early clinical course, as well as the laboratory observations in such cases.

The initial treatment consisted of immobilization, elevation and cooling of the involved hands with ice packs. The men were placed on a high protein diet with supplementary multiple vitamins and were given rutin 20 mg. three times a day, the latter because of the possible therapeutic effects in capillary damage.

Penicillin therapy, 300,000 units (duracillin) per day, was started in case 1 after drainage of the bullae with the concurrent development of a low grade fever and increase in sedimentation rate; in cases 2 and 3 it was started after the first debridement.

The surgical debridements were performed in cases 1, 2 and 3 on the thirty-ninth, fifty-third and sixty-seventh days after exposure, with the patient under general anesthesia because of the extreme tenderness of the tissue.

Prognosis is dependent on the status of the vascular supply to the burned areas, especially as related to the skin grafting. Careful late follow-up studies are necessary in order that early malignant changes may be recognized.

High Heels and Low Heels

Norman C. Lake, M.D., M.S., D.Sc., F.R.C.S. Senior Surgeon, Charing Cross Hospital. In THE PRACTITIONER, 163:975:221, September 1949.

Palliative Measures—This recital of the consequences of wearing high heels is formidable enough, and there can be little doubt that there is nothing to be said medically in favor of such a fashion.

This article is not concerned with the treatment of the various resulting deformities, but it must be emphasized that when patients first present themselves for relief, the conditions usually have been too long established to permit of radical replacement, nor can high heels be abandoned immediately, owing to the "set" of the foot. The most that can be done is to afford as much ease as possible by palliative measures, sometimes surgical, sometimes chiropodial.

It is only too clear that the correct way to deal with these conditions is prevention, but there is little hope of doing this unless fashion can be made subservient to anatomical and physiological demands. This involves a difficult psychological problem that so far has defied solution.

Nonsurgical Orthopedic Management of Rheumatoid Arthritis

Daniel E. Kavanaugh, M.D., Newark, N. J. In THE JOURNAL OF THE MEDICAL SOCIETY OF NEW JERSEY, 46:9:421, September 1949.

The treatment of muscle atrophy and muscle incoordination begins when the orthopedist first sees the patient, if it has not already been instituted. To preserve or restore muscle power in the upper and lower extremities, it is necessary to establish a definite muscle training program, supervised by the physician, in which the patient and the physical therapy department participate. The patient's participation is probably the more important. We insist that the patient develop the habit of voluntary exercise of all joints as much as possible every day. He remains diligent in carrying out these exercises not only throughout his convalescence but after he has become successfully ambulatory. With a proper muscle training program a number of our patients, confined to bed for a few months or more, have had sufficient muscle power to require no support of the knees when they have reached the ambulatory stage.

Discussion on Peripheral Vascular Diseases (Abridged)

L. C. Hill, M.D., F.R.C.P. In the PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE, XLII:5:349, May 1949.

The treatment of peripheral vascular disorders commences with the correction of other disabilities that may have been found, e.g. diabetes, anemia. When the legs are involved, hygiene of the feet must be carried out with great care; this point must be stressed as it is frequently forgotten.

The object of the treatment is to overcome the constriction of the affected arteries by producing vasodilatation or, if the constriction cannot be overcome, by encouraging the development of an adequate collateral circulation. Methods for producing the vasodilatation are:

(1) Heat.—By applying radiant heat, infra-red rays or short wave diathermy to a relatively unaffected part of the body vasodilatation of the affected arteries may be produced, without too marked an increase in the metabolic demands of the tissues of the affected limb, which would occur if the heat was applied directly to the affected part.

(2) Histamine and choline derivatives.—These substances are of most value when the smaller peripheral arteries are involved. The disadvantage is the unpleasant side-effects. Recently I have been using acetyl-B-methylcholine by iontophoresis and have had to stop only two patients from receiving this mode of treatment.

(3) Electrical currents.—Sinusoidal and galvanic currents produce well-marked vasodilatation and are frequently used in cases of acrocyanosis, but the success of this mode of treatment on these cases is most beneficial when used in the early spring.

(4) Tetra-ethyl-ammonium chloride or bromide.—Through its action upon the autonomic synapses this drug produces a rapid vasodilatation. It has been found to be of value in cases of arteriosclerosis when intermittent claudication was severe and other methods of treatment could not be carried out.

(5) Intermittent venous occlusion.—It was claimed by Collins and Wilensky that 70 per cent of cases suffering from thrombo-angiitis obliterans and arteriosclerosis obliterans obtained relief by this method. I have been unable to get such satisfactory results but in a number of cases considerable relief of pain has been obtained. When treating patients by this method it is important to realize that thrombosis of the affected arteries may be precipitated unless the technic of using the apparatus is carefully checked.

(6) Exercises.—Buerger's exercises though of value in otherwise healthy men with thrombo-angiitis obliterans are too strenuous for patients with arteriosclerosis obliterans.

(7) Sympathetic surgery.—By this operation a more persistent means of producing vasodilatation than by other methods is provided. Dramatic results may be seen when used in thrombo-angiitis obliterans and Raynaud's disease, though in the latter a return of symptoms frequently occurs in a severe degree two to three years after the operation: I have not met a patient who has regretted having this operation for Raynaud's disease. In arteriosclerosis obliterans and atheroma, sympathectomy may ward off the onset of gangrene for a period but the disease is progressive and ultimately gangrene may occur. Intermittent claudication may not be relieved by the sympathectomy and sometimes paralyzing the gastrocnemius may be necessary.

My present opinion is that sympathectomy should be performed if the limb shows that power of vasodilatation is retained and that there is no other contraindication to operation.

Painful Feet

M. G. Food, M.D., L.R.C.P., L.R.C.S.Ed. In THE PRACTITIONER, 163:975:229, September 1949.

Experience obtained in the Army in a large number of cases seems to confirm the view that the syndrome of painful feet, whether or not associated with flat foot or similar anomalies, not infrequently is due to a muscular disease of the foot—foot myalgia. The muscles commonly affected are the flexor hallucis brevis, the flexor digitorum brevis, the peroneus brevis, and the Achilles tendon. The objective signs centering around the "myalgic spots" which can be located by objective criteria are described. Injection of procaine is recommended for relieving this pain, restoring the function of the diseased muscles in a short time, and leading to a rapid cure. It is suggested that the injection of procaine be used in all cases of painful feet not accounted for by any organic disease, as a diagnostic test in order to prove conclusively whether or not a given pain is of muscular origin.

Facial Palsy and Poliomyelitis

Thomas Stapleton, M.A., B.M. Oxfd., M.R.C.P., D.C.H. In THE LANCET, 257:6577:510, September 1949.

The etiology of the facial palsy of lower motor neurone type, sometimes known as Bell's palsy, is obscure. Local chilling has been regarded as a contributing factor, and an association with the virus of herpes zoster occasionally has been noted. Usually, however, no satisfactory explanation is found.

Walshe (1947) has drawn attention to the seasonal incidence, cases tending to occur in groups in the late autumn and early spring.

The possibility of an association between isolated facial palsy and poliomyelitis has been considered previously (Lavergne, et al 1932, Kissel 1948, Wyllie 1944). Lavergne et al (1932) were able to find records of over 80 cases of isolated facial palsy which had been attributed to this infection.

The observers in Malta (Agius et al 1945) attributed their cases of isolated facial palsy to poliomyelitis (1) because of the absence of other causes, (2) because of the presence of the same kind of general disturbance, and (3) because of their occurrence during an epidemic period. The first of these criteria applies to all the cases of isolated facial palsy in the present series, and the last applies to 7 of the 8 cases. Only 4 of the 8 had any associated malaise.

Though there is a suggestion that the cases of facial palsy unaccompanied by other paralysis had a cause in common with the cases of poliomyelitis, this hypothesis is not, of course, proven. The numbers were small; the cases of facial palsy seen in the outpatient department may not have been a true reflection of the incidence; the notification figures of poliomyelitis, in view of the difficulties in diagnosis, only give an indication of the time of the epidemic; and the concurrence of the outbreaks was observed only during the one year.

The simultaneous occurrence of a group of cases of isolated facial palsy and of poliomyelitis is recorded. The possibility that the cases of facial palsy were caused by the virus of poliomyelitis is discussed.

An Electromyographic Study of Spasticity

D. B. Lindsley, L. H. Schreiner and H. W. Magoun, Departments of Anatomy and Psychology, Northwestern University Medical School, Chicago, Illinois. In JOURNAL OF NEUROPHYSIOLOGY, XII:5:197, May 1949.

The exaggerated activity of spinal postural mechanisms, called spasticity, has been recognized from the time of Jackson to be precipitated by injury to neural components normally suppressing postural reflexes. The location of these suppressor cell stations and the organization of their connections with the cord have since been determined in experimental studies. The spasticity which follows injury to these suppressor systems also has received considerable experimental attention, but its appraisal by direct observation has not always provided an ideal basis for further study.

The success of electromyographic investigation of spasticity in man has led to the use of this objective technic in studying the effect of lesions of the cat's suppressor areas, made singly and in combination.

Electromyographic study of spasticity following injury to suppressor systems of the cat's brain indicated that its most characteristic feature was an exaggeration of stretch reflexes, chiefly in antigravity muscles. Threshold was low, response was excessive and its prolongation after stretch was frequent. In addition, tendon reflexes were augmented and repetitive, and commonly induced clonus.

Clinical Electromyography in the Royal Air Force

Flight Lieutenant A. T. Richardson, M.B., B.S. In the PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE, XLII:8:587, August 1949.

The particular aspect of electrodiagnosis in the Royal Air Force that I wish to present is clinical electromyography. The pioneer work of Piper in 1912 set the subject going in Germany. In this country the work of Adrian presented in his Oliver Sharpey Lectures of 1925 and later his work with Bronk did much to define the physiological basis upon which myography rests. To record muscle action potentials these early workers used string galvanometers, detecting the muscle potentials at first by surface electrodes and later, after their introduction by Rehn in 1921, by needle electrodes.

We are of the opinion that, in the present state of our knowledge, electromyography is of proved value in peripheral nerve injuries and disease, in that it can provide concrete evidence of nerve damage recovery and retention of any function before these phenomena can be estimated clinically.

Diagnostic Technics for Children with Cerebral Palsy

Eric Denhoff, M.D. In THE RHODE ISLAND MEDICAL JOURNAL, 32:9:483, September 1949.

Rhode Island's center for cerebral palsied children, The Meeting Street School, has completed its first year on a demonstration basis. There, these children receive treatment, training and guidance under medical supervision. The results are proving satisfactory, if one believes that the major consideration in cerebral palsy is rehabilitating these children and their families to some measure of normal living. By using the school as a hub for the many therapeutic programs the successful handling of the cerebral palsied entails, these children have made enough progress to warrant continuing the experiment.

An important feature of the school is the research approach, which means the taking of detailed medical histories is essential.

Diagnostic Technics

General considerations—Cerebral palsy should not be considered primarily a condition of muscular dysfunction characterized by spasticity, athetosis, or dystonia, but rather one in which convulsions, retardation, and personality disorders may be part of the picture.

Contributory to the neurological examination is evidence of disordered thinking or a personality defect. These are usually manifested by behavior traits, such as a variability in mood, hyperactivity, impulsiveness, and short attention span. These symptoms, in an overtly awkward child suggests a mild type of cerebral palsy.

Conclusions and Summary

A diagnosis of cerebral palsy may be made early in infancy in the majority of children with the signs and symptoms that have been outlined.

A history should include information on familial or genetic factors, maternal health, pregnancy, delivery and the enonatal periods.

A developmental history will often give leads in the diagnosis. The main ones are dates of development of head control, rolling, crawling, and standing with support.

Developmental tests which are essential in establishing a diagnosis have been outlined.

A short neurological examination, starting with the head and working downwards will invariably reveal signs of brain injury in those cases with suspicious histories or developmental tests.

Book Reviews

Surgical Management of Vascular Diseases. *By Gerald H. Pratt, M.D., F.A.C.S., Associate Clinical Professor of Surgery, New York University; Chief of the Vascular Clinic, and Associate Attending Surgeon, Saint Vincent's Hospital, City of New York; Attending Surgeon, St. Clare's Hospital, City of New York; Diplomate of American Board of Surgery; Commander, Medical Corps, United States Naval Reserve. Cloth. Price, $10. Pp. 496, with 181 illustrations and 2 plates in color. Lea & Febiger, Washington Square, Philadelphia 5, 1949.*

The author's purpose of this book is to present the most acceptable forms of surgical treatment of the various types of vascular disorders. Treatment is emphasized but anatomy, pathology and diagnosis are included.

The book is divided into six sections: I—Nomenclature and Case History, II—The Arterial System, III—The Venous System, IV—The Lymphatic System, V—Surgery of the Heart, and VI—Special Technics. The "Nomenclature of Diseases and Abnormalities of the Blood and Lymph Vessels of the Extremities" as prepared by a Committee of the American Heart Association is included. This outline is intended to provide a list of preferred and universal terms to be used by authors and research workers. However, this author believes it is not a workable classification from the surgical standpoint.

This book is written for the general practitioner, internist, surgeon, undergraduate and postgraduate medical student. Physical therapists will find it valuable as a reference for up-to-date information concerning the surgical treatment of vascular diseases.

Applied Anatomy and Kinesiology: The Mechanism of Muscular Movement. *By Wilbur Pardon Bowers, M.S., late professor of Physical Education, Michigan State Normal College, Ypsilanti, Michigan. Sixth Edition, revised by Henry A. Stone, M.S., Associate Supervisor, Department of Physical Education, University of California, Berkeley, California. Cloth. Price, $4.75. Pp. 390, with 234 illustrations, 18 in color. Lea & Febiger, Washington Square, Philadelphia 6, 1949.*

"To completely explain purposeful muscular movement," the author states, "it is obviously necessary to break the total picture into several fragments, to make it into sort of a jig saw puzzle, and then to examine each portion, ever keeping in mind its relationship to the whole! Therefore, physics, chemistry, anatomy, neurology, physiology, and psychology all contribute toward complete understanding." "Kinesiology," he further states, "is a major fragment of the complete picture. . . . Kinesiology is satisfied with what the muscle does to, and in, its environment from the mechanical aspects. It investigates muscular action by breaking a movement down into its components. It identifies the muscle used, the sequence employed, and endeavors to estimate the extent of their individual participation." Such is the content of this edition.

Part I contains general principles of muscular action and is divided into sections on mechanical principles, chemistry of muscle action, and neurological aspects of muscular control. Many of the contributions to the field of biokinetics of such authorities as W. O. Fenn, Colin McKenzie, J. C. Eccles, C. S. Sherrington, A. V. Hill, F. J. Fulton, D. Bodian and others are mentioned. This section on the whole is an adequate survey and summary of the fragments of basic science that contribute the understanding of muscular action, although by no means is it a complete one.

Parts II, III, and IV contain anatomical descriptions and statements of the function of the various muscles of the body. Part V contains classification and integration of muscle actions.

All of the above sections are well written, quite comprehensive, and would serve as an excellent reference for physical therapists. The remainder of the book is more suitable for physical education than physical therapy, because of the viewpoint and content rather than the subject matter.

The remaining sections contain the general kinesiology of erect posture, walking, running, jumping, and games and sports. The portion dealing with the formalized Swedish exercises, included in previous editions, has been deleted and replaced by material relating to the body mechanics of everyday activities.

The book is written for the profession of physical education and is essentially most valuable to that profession. However, as stated above, many sections would be useful to physical therapists as a reference work on the mechanics of muscle action.

Studies in Psychosomatic Medicine: An Approach to the Cause and Treatment of Vegetative Disturbances. *By Franz Alexander, M.D., and Thomas Morton French, M.D., with others. Cloth. Price, $7.50. Pp. 568. The Ronald Press Company, 15 East 26th St., New York 10, 1948.*

This book is a series of papers collected by the editors to present in a comprehensive style the basis of psychosomatic disorders as understood by psychoanalytical principles. There is nothing new, for practically all of the articles had been published within the previous sixteen years. Contributions come from numerous past or present members of the staff of the Chicago Institute for Psychoanalysis. The book is arranged in sections each of which is devoted to a particular body structure, such as disturbances of the gastro-intestinal tract, disturbances of the respiratory system, cardiovascular disturbances and so on. It then appears that the editors of the book simply selected whatever available material there was that had been published by the Institute and divided it up into the appropriate departments. Perhaps the apology in the preface is the one reason that excuses such a procedure, to wit, "Many of them (the papers) are no longer readily available elsewhere."

There is a great and boring amount of repetition in many of the articles. The lead article in most sections is good and then one gets annoyed with further detailed case histories and references back to the article that was just read and covering exactly the same material. The book could be greatly condensed without any loss of significant material. A real contribution could have been made by better selection and perhaps the addition of new articles which could synthesize the material and bring the subject up to date.

In spite of these criticisms one can compliment the original work done by the members of the Institute as displayed by some of the papers. Doctor Alexander's article on the "Fundamental Concepts of Psychosomatic

Research" is excellent. Here he points out the fundamental basis of psychosomatic disturbances as being evidence of autonomic dysfunction wherein the somatic symptoms are not substitute expressions of repressed emotions, but they are normal physiological accompaniments of the emotion. This is in contrast to the sensory-motor hysterical conversion symptoms which are substitute expressions of the emotion. Other articles supplied by Alexander are also very informative. The discussion by Grinker of "Hypothalamic Functions in Psychosomatic Interrelations" is worth re-reading. Other articles are worthy of special mention but their lustre is disturbed by lengthy case reports which are of little benefit in a textbook.

No doubt this book represents a lot of work. It is one way of keeping together the valuable original contributions made by the Institute and this is perhaps its chief value. However, it hardly merits recommendation as a textbook on the subject or even as a reference work because of the narrow confines whence come the selections.

A Textbook of Physiology. *Originally by William H. Howell, M.D.; edited by John F. Fulton, M.D., Sterling Professor of Physiology, Yale University School of Medicine. Sixteenth edition. Cloth. Price, $10. Pp. 1258, with 556 illustrations. W. B. Saunders Company, West Washington Square, Philadelphia, 1949.*

This is the sixteenth edition of an outstanding textbook on physiology which was published originally in 1905 under the authorship of William H. Howell. The high standard set by previous editions has been maintained thoroughly. This edition, edited by John F. Fulton, also has had the benefit of an editorial board, composed of outstanding physiologists in this country. The various sections are written by authoritative specialists.

By deleting obsolete material, the editors have incorporated a large volume of new material without lengthening the text. The most extensive additon is in Dr. Jane Russell's chapters on the endocrines. The section on the electrocardiogram has been completely rewritten by Doctors Nahum and Chernoff. Other new chapters are those on the gastro-intestinal tract by Dr. Paul F. Fenten, that on muscle by Dr. Samuel Gelfan and the cerebrospinal fluid by Dr. Robert Livingston. All of the chapters have been revised and brought up to date.

This is a comprehensive textbook of physiology, clearly and concisely written, edited with skill and judgment. This textbook is highly recommended to all students of physiology. It is especially recommended to physiatrists and physical therapists as an excellent reference on the physiology of muscle and nerve and the function of the central nervous system.

Isotopic Tracers and Nuclear Radiations: With Applications to Biology and Medicine. *By William E. Siri, with contributions by Ellsworth C. Dougherty, Cornelius A. Tobias, Rayburn W. Dunn, James S. Robertson, and Patricia P. Weymouth, Division of Medical Physics, Department of Physics, and Radiation Laboratory, University of California. First edition. Cloth. Price, $12.50. Pp. 653, with illustrations, with 49 tables. McGraw-Hill Book Company, Inc., 330 West 42nd St., New York 18, 1949.*

With the development of such high energy accelerators as the cyclotron, betatron and the synchroton, the physicist began an entirely new and successful era of scientific development. These instruments with the nuclear reacting pile provide the means of understanding the actual nature of matter. Radio-active materials and nuclear radiations are some of the most recent tools of the biologist and medical scientist. Isotopic tracers are being used in a great many physiological investigations and what their ultimate place will be in medicine would be difficult to predict. The work of early investigators is demonstrating some of the limitations of using isotopic tracers both for diagnostic and treatment purposes.

This unusual book will be welcomed by the physicist and those medical researchers who can get the latest information without having to read through many articles scattered among a large number of journals not always accessible. The interpretation of the work presented also is most valuable.

The book is divided into three parts: part 1 is entitled "Isotopes and Nuclear Radiations." As the title indicates this is a physical presentation of the properties of nuclei, gamma rays, beta particles, protons, deutrons and alpha particles, and neutrons. Included in this part is the invaluable Seaborg and Perlman table of isotopes. This is a complete list of all the artificial and natural radio-active and stable isotopes.

Part 2 discusses methods and instruments such as the mass spectrograph, the Geiger-Meuller Counters, ionization chambers. A description of the cyclotron, betatron and synchroton is given. There is also a very lucid and valuable section on the radio-autograph, internal dosimetry, and the treatment of biological tissues for recovery of radio-active elements.

Part 3 is given over to biological and medical applications of isotopes. It is subdivided into a critique of the biological and medical application of isotopes—a presentation of the elements arranged according to their biological significance and the use of their isotopes. A chapter is given over to isotopes in medical therapy and diagnosis. The volume contains a very complete and valuable bibliography.

Unless the reader is well grounded in physics and mathematics he will find the reading most difficult and for that reason this very important volume will not be read by the physician unless he is interested in research of this nature. For those physicians who have a good background of higher mathematics the book should provide fascinating reading in this important work pointing to new horizons of medical achievement.

Varicose Veins and Venous Thrombosis of the Lower Extremities. *By Anthony M. Barone, M.D. With a foreword by Geza de Takats, M.D., M.Surg., F.A.C.S., Associate Professor of Surgery, University of Illinois, College of Medicine, Chicago. Second edition. Paper. Price, $2.50. Pp. 70. with 14 illustrations. Anthony M. Barone, M.D., 4000 W. North Ave., Chicago 39, 1948.*

This is a small but excellent monograph. The book covers the subject in all phases. It is in outline form and suffers nothing for it. Such a text fills a very definite need for the busy physician, the student and the teacher. The material is up to date, the information having been gathered not only from abstracts but from personal experience in the author's private practice as well as in the varicose vein clinic of the University of Illinois Research and Educational Hospital in Chicago. The book is splendidly illustrated and has an excellent bibliography. There is, however, one omission by the author. The subject of physical therapy is not mentioned at any time. This would seem to be unfortunate because physical therapy does play some part in the treatment of this pathology.

This monogram should have a place in every physician's and physical therapist's library.

An Atlas of Amputations. *By Donald B. Slocum, M.D., M.S., Orthopedic Surgeon, Sacred Heart General Hospital, Eugene, Oregon; Member of American Academy of Orthopedic Surgeons; Member of the American Society for Surgery of the Hand; Branch Consultant in Orthopedic Surgery, U. S. Veterans Administration; Formerly Chief of the Amputation Section, Walter Reed General Hospital, Washington, D. C. Cloth. Price, $20. Pp. 562, with 564 illustrations. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, Mo., 1949.*

This book is written by an orthopedic surgeon who was associated with a large number of amputees at an army amputation center during World War II. In the preface the author gives credit to Dr. Norman Kirk for his work in collecting and segregating the material on amputation surgery during World War I and for placing it on the sound surgical basis which it required. During World War II, Doctor Kirk, as Surgeon General of the Army, saw the need for and established amputation centers. As a result of experiences in these two wars, present-day amputation has evolved until it is no longer a cutting off of a part, but a phase of reconstruction employing plastic and orthopedic surgery in proper balance.

The purpose of this book is to present the methods of the past which have stood the test of time and to add the recent experience in surgery, rehabilitation and prosthetics. Emphasis is placed upon the importance of function and the successful rehabilitation of the patient.

The book is divided into four parts: Orientation, Surgical Considerations, Surgical Technics and the Convalescent Period. Part IV—The Convalescent Period—is of particular interest to physical therapists. In late convalescence (three to four weeks following surgery), the author states: "Treatment now lies largely within the field of physical medicine and consists of continued bandaging, massage and therapeutic exercises." This section contains chapters on "Complications of the Final Stump," "The Mechanics of Normal and Amputee Gait," "Prostheses," "Physical Rehabilitation of the Upper Extremity Amputee," "The Amputee and Sports" and "Physical Medicine in the Treatment of Lower Extremity Amputations," written by Dr. Donald L. Rose.

The chapter on the mechanics of normal and amputee gait consists largely of full page illustrations made possible by stroboscopic photography and conclusions verified through a study of ultra-high-speed motion pictures. The program of physical medicine given in the chapter on "Physical Medicine in the Treatment of Lower Extremity Amputations" is given quite in detail but is intended to serve only as a general guide for those interested in this field. Evaluation of body mechanics, tests for flexibility, extensibility and contractures, muscle tests, massage, therapeutic exercise, bandaging, preprosthetic treatment and training in the use of the prosthesis including daily activities are included.

This book is profusely illustrated throughout and contains much valuable material for physical therapists who are treating amputees.

The Science and Art of Joint Manipulation. Vol. I—The Extremities. *By James Mennell, M.A., M.D., Consulting Physician in Physical Medicine, St. Thomas' Hospital and former Lecturer to the Physiotherapy Training School; Hon. Fellow Chartered Society of Physiotherapy; one time visiting Associate Professor of Physical Medicine, University of Southern California; Awarded the Golden Keys with Life Membership of the American Congress of Physical Medicine and the American Physical Therapy Association. Second Edition. Cloth. Price, $7.50. Pp. 215, with 299 illustrations. The Blakiston Company, 1012 Walnut St., Philadelphia 5, 1949.*

As the title implies, Mennell's objective in writing this book is to establish a technic for manipulation of the joints of the extremities which is based on scientific laws and to give the technic of applying the art. He states that it is "easy to learn the science of joint manipulation, but the technic of applying the art is by no means so simple. It is difficult to teach, it is difficult to learn, and prolonged practice is the only means of attaining perfection."

After nearly forty years of practice of joint manipulation the author is convinced that a great amount of human disability and suffering is amenable to treatment by manipulation but it is only one of many valuable physical agents. To rely on manipulation as the one superlative remedy is unjustifiable.

In this new edition three new and two alternate technics are included. Two concern the manipulation of the shoulder joint and one concerns the joints of the cuboid. New illustrations and x-ray photographs have been added to the large number of line drawings, photographs and roentgenograms of the previous edition.

The actual technics of joint manipulation for each joint of the extremities are given in detail. The positions of the manipulator's hands on the patient for the various technics is shown by excellent photographs. The technics used are based on the anatomical structure of each joint and this is shown by x-ray photographs and line drawings.

The book is divided into three parts: Part I—General Considerations; Part II—The Joints of the Upper Extremity, and Part III—The Joints of the Lower Extremity.

This book is highly recommended to all who are interested in manipulation of the joints. The physicians and physical therapists who observed and worked with Doctor Mennell during his visit to the United States will find this monograph of particular interest.

Rehabilitation of the Handicapped: A Survey of Means and Methods. *Edited by William H. Soden, Executive Assistant, Physical Medicine Rehabilitation Service, Veterans Administration Hospital, Northampton, Massachusetts. Foreword by Sidney Licht, M.D., Editor, "Occupational Therapy and Rehabilitation." Cloth. Price, $5. The Ronald Press Company, 15 East 26th St., New York 10, 1949.*

The editor and forty-four contributors have assembled in this book the procedures which are in current use for the mental and physical rehabilitation of handicapped persons. They take the viewpoint that the rehabilitation process should begin when disability occurs and should continue until the disabled person is utilizing his limited abilities to the maximum. They appreciate that it is necessary to have scientific medical care throughout the process. Also that nursing, physical therapy, occupational therapy, psychology, social work, vocational guidance, workshop organization and enlightened efforts of public-spirited citizens must all play an important role if the rehabilitation process is to be effective.

The book is divided into five parts: general medicine and surgical technics, neurological methods, psychiatric developments, vocational and social rehabilitation, and educational and psychological trends. The various chapters are written by authorities in the various fields which contribute to the total program of rehabilitation. This can be recommended as good reading for all persons who are interested in solving the problem presented by the large number of handicapped individuals.

Blakiston's New Gould Medical Dictionary. *A modern comprehensive dictionary of the terms used in all branches of medicine and allied sciences, including medical physics and chemistry, dentistry, pharmacy, nursing, veterinary medicine, zoology and botany, as well as medicolegal terms; with illustrations and tables. Editors: Harold Wellington Jones, M.D.; Normand L. Hoerr, M.D., and Arthur Osol, Ph.D., with the cooperation of an editorial board and 80 contributors. First edition. Pp. 1294, with 252 illustrations on 45 plates, 129 in color. Price: Textbook edition, $8.50; deluxe edition, $13.50; thin paper, $10.75. The Blakiston Company, 1012 Walnut St., Philadelphia 5, 1949.*

This is a completely new reference work based upon Gould's Medical Dictionary. Rather than undertake a revision of Gould's dictionary the editors decided it would be necessary to prepare an entirely new work to include the many advances made in the field of medicine during the past few years. An eminent group of contributors with a nationally known group of editors have succeeded in producing an unusually useful and authentic dictionary. It is more than a medical dictionary for it is equally useful in the related sciences.

The editors have incorporated thousands of new entries in scores of fields. Each entry has been critically examined and defined in conformity with modern lexicographic standards. It would be miraculous if no omissions or errors of definition occurred in such a monumental task. For instance, one notes the absence of the term "direct current" although "galvanism" is defined. It would be impossible to omit the archaic term of galvanism" but the modern term "direct current" already appearing in medical literature should be included. The term "ion transfer" is not to be found although this is the official term adopted by the Council of Physical Medicine and Rehabilitation of the American Medical Association. "Iontophoresis" is incorrectly defined as "the migration of ionic medication through intact skin under the influence of a direct electric current." Iontophoresis is the movement of ions in a solution from one electrode to the other under the influence of a direct current. One also notes the absence of the term "physiatrist." It is a new term, it is true, but old enough to be included in a 1949 work.

The colored plates and illustrations are all together in one section of the book. This is an excellent idea. The colored plates are beautifully done. The usefulness of the dictionary is markedly enhanced by having all illustrations in a complete section.

There is also a most useful appendix with tables of arteries, bones, joints and ligaments, muscles, nerves and veins. There are tables of the normal values of the blood constituents, diets, elements, enzymes, hormones, and one of medical signs and symbols. In addition there is a table of the micro-organisms most common to man, thermometric equivalents, vitamins and weights and measures. The busy practitioner will find this appendix full of most useful information.

This new medical dictionary should fill a definite need. It is highly recommended.

Arthritis and Related Conditions. *Edited by Theodore Franklin Bach, M.D., F.A.C.P., Assistant Professor of Medicine in the Graduate School of Medicine of the University of Pennsylvania; Chief of the Arthritic Clinic, Abington Memorial Hospital, Abington, Pa. Cloth. Price, $6.50. Pp. 472, with 146 illustrations. The F. A. Davis Company, 1914 Cherry St., Philadelphia 3, 1948.*

Here is an authoritative work on clinical arthritis that was written and edited by practicing physicians to fit the needs of the general practitioner. The study and successful treatment of thousands of patients in America's oldest arthritic clinic are presented in this one volume.

Care has been taken by the authors to elaborate on such effective therapeutic details as the physician can readily apply and which with many tables, charts and illustrations, will prove helpful in planning treatment in his individual cases.

Chapter XX entitled "Physical Therapy in Arthritis" is written by Dr. K. G. Hansson. He presents this under the following headings: physical therapy and general nutrition in arthritis, physical therapy and circulation in arthritis, physical therapy and skeletal defects in arthritis, physical therapy applied to the muscular system in arthritis, physical therapy applied to the nervous system in arthritis, heliotherapy, electrotherapy, massage in arthritis, exercises in arthritis. Doctor Hansson believes that better results would be obtained from local massage for an atrophied muscle if physicians were more discriminating in their prescriptions of massage in the treatment of the arthritic patient. He summarizes his ideas on massage and exercises by stating that these two valuable agents are of great importance in the management of the arthritic patient and goes farther to say that they are indispensible in arthritic therapeutics. They are not specific remedies, but serve as complementary agents in every treatment that is being used in arthritis. He emphasizes that physicians should be familiar with the physiologic action of these agents and should prescribe them for a definite purpose.

Fractures. *By Paul B. Magnuson, M.D., F.A.C.S., Professor of Bone and Joint Surgery and Chairman of the Department, Northwestern University Medical School; Attending Surgeon, Passavant Memorial Hospital and Wesley Memorial Hospital, Chicago, and James K. Stack, M.D., F.A.C.S., Assistant Professor of Bone and Joint Surgery, Northwestern University Medical School; Attending Surgeon, Passavant Memorial Hospital and Cook County Hospital, Chicago. Fifth edition. Cloth. Price, $7. Pp. 538, with 323 illustrations. J. B. Lippincott Company, East Washington Square, Philadelphia 5, 1949.*

The fifth edition of this authoritative book on the treatment of fractures has been brought up to date in the light of recent knowledge in this field. However, there are no essential changes in the original form of the book or the fundamentals involved in the treatment of fractures. Doctor Magnuson believes that, if truly fundamental, these do not change from year to year.

The section on the pathology of fractures is unchanged since this concept has not changed. In this edition an attempt has been made to include anatomy, the physiology of bone and muscle, and the pathology of fractures in the treatment of the individual fracture. The principles of treatment are based on these fundamentals. The newer concepts of early ambulation are included. Chapters on applied anatomy of the spinal column and the spinal cord, fracture-dislocations of the spinal column and fractures of the skull are written by Dr. Loyal Davis, Professor of Surgery at Northwestern University, and these have been brought up to date in the light of newer knowledge in this field. Dr. John S. Coulter, Professor of Physical Medicine at Northwestern University, has written two chapters on physical therapy in the treatment of fractures. These have been revised.

This book is highly recommended to physical therapists. The rationale of treatment which is based on the fundamentals of anatomy, physiology and pathology and the simplicity of presentation make this book extremely valuable to physical therapists.

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Meet Our New Contributors

Hipps, Herbert E., M.D., 1604 Columbus, Waco, Texas. Doctor Hipps received his A.B. degree in 1925 from Baylor University, Waco, Texas, and his M.D. degree in 1929 from Baylor College of Medicine. He has held the following positions: Chief, Crippled Children's Hospital, Marlin, Texas, 1935-42; Chief, Orthopedic Service, U. S. Naval Hospital, Corpus Christi, Texas, 1942-43; Chief, Orthopedic Service, USS Refuge, 1943-45. At present he is on the staff of Hillcrest Hospital and Providence Hospital, and is Chief Orthopedic Surgeon, Crippled Children's Hospital, Waco, Texas. Member: American Medical Association, American Academy of Orthopedic Surgery, Southwestern Surgical Congress; Fellow, American College of Surgeons; certified Orthopedic Surgery 1936 (American Board of Orthopedic Surgery).

Schulz, Beatrice F., Washington University School of Medicine, Department of Physical Therapy, 600 S. Kingshighway, St. Louis 10, Missouri, Miss Schulz received her certificate of physical therapy from Barnes Hospital in 1942, and her B.S. degree from Washington University in 1949. She has served as an occupational therapist at the Mayo Clinic and Michael Reese Hospital, and as a physical therapist at Barnes Hospital, St. Louis, and at Washington University School of Medicine where she is now employed. Member: American Physical Therapy Association, American Registry of Physical Therapy Technicians, American Occupational Therapy Association.

Stevenson, Andrey W., M.D., New York State Rehabilitation Hospital, West Haverstraw, New York. Doctor Stevenson received his M.D. degree in 1940 from Ohio State Medical School. At present he is Senior Orthopedic Resident at the New York State Rehabilitation Hospital, West Haverstraw. Member: Washington State Medical Society.

Waters, Genevieve, 2128 Austin Avenue, Waco, Texas. Miss Waters received her physical therapy training at Posse School of Physical Education, from which she received her diploma in 1942. She has served as a physical therapist in epidemic areas for the National Foundation for Infantile Paralysis, at Crippled Children's Hospital, Waco, and at present is employed in the Physical Therapy Department of the Veterans Administration Hospital in Waco. Member: American Physical Therapy Association.

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Copy for want-ads must be submitted to the American Physical Therapy Association by the 10th of the month **PRECEDING MONTH OF ISSUE,** namely, September 10th for ads to appear in the October issue. The magazine is published monthly on the 15th of the month.

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